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CONTENTS.

	PAGE
Multiple Hereditary Telangiectases causing Hemorrhage (Hereditary Hemorrhagic Telangiectasia). (Illustrated.) By Frederic M. Hanes, M. D.	63
The Place of Protozoology in the Medical School Curriculum. By Oscar T. Schultz, M. D.	74
A Case of General Infection with *Bacillus Mucosus Capsulatus* followed by an Areolar Abscess of the Liver and General Peritonitis. Autopsy. (Illustrated.) By J. H. Hewitt, M. D.	77
The Influence of Sewers and General Sanitation upon the Prevalence of Tuberculosis. By George M. Kober, M. D.	80
Edward L. Trudeau, M. D.	85
Tuberculosis—A Plan of Study. By W. L. Moss, M. D.	87
Proceedings of Societies. The Johns Hopkins Medical Society	88
The Tonsil as a Factor in the Cause of Disease [Dr. J. Bordley];—A Case of Mikulicz's Disease [Dr. R. L. Randolph];—A Study of Leprosy with Especial Reference to its Occurrence in the Bahama Islands [Dr. C. A. Penrose];—Exhibition of Surgical Cases [Dr. J. W. Churchman];—Exhibition of a Case of Alopecia Universalis [Dr. L. F. Barker];—A New System of Open Air Construction for Hospitals and Tenement Houses [Dr. Sarason].	
Notes on New Books	90
Books Received	94

MULTIPLE HEREDITARY TELANGIECTASES CAUSING HEMORRHAGE (HEREDITARY HEMORRHAGIC TELANGIECTASIA).

By Frederic M. Hanes, M. D.,

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The remarkable disease which forms the subject of this communication is either rare or has been seldom recognized. A description of the disease has appeared but once in American literature.

It is the purpose of this paper to describe eight typical instances of the affection occurring in two unrelated families; to review briefly all previously reported cases; to present a clinical picture of, and suggest a name for the disease.

Family XIV (Hanes, 1908).—*Recurring hemorrhages in four generations of one family; multiple telangiectases of skin and mucous membranes; no symptoms of hemophilia.*

Case I.—Mrs. Margaret R. is 53 years of age and has been subject to severe nose bleed for 43 years.

Family History.—Her mother, who died at 48 from heart disease, with dropsy and cough, suffered all her life with severe epistaxis. The patient says that she has frequently seen her mother faint following prolonged hemorrhage from the nose. She also states that upon the face, lips and within the mouth of her mother were numerous red spots similar to those upon her own face and lips. The patient had two brothers, both of whom were troubled all their lives with epistaxis and both exhibited the typical red spots upon face and lips. One of these brothers lived to be 53 years old, had a marked alcoholic history, and all the members of the family state that his face was greatly disfigured by the numerous red spots upon it. It is etiologically interesting that he always spoke of the spots as "whiskey bumps." The patient's father never suffered with nose bleed.

Personal History.—She has been subject to severe bleedings from the nose since childhood; scarcely a week has passed that her nose has not bled once or twice, often every day. Since her thirty-seventh year the epistaxis has increased in frequency and severity. It is not uncommon for her nose to bleed several hours at a time, all attempts to check the hemorrhage proving futile. The epistaxis is frequently spontaneous and the slightest injury to the nose is sufficient to provoke severe hemorrhage. Concomitant with the increase in severity of the epistaxis has been the growth of telangiectatic spots upon her face, lips and tongue. She does not bleed excessively from cuts, has never vomited blood, her gums do not bleed, nor has she ever noted blood in her urine or stools. She ceased to menstruate at 51. Previous to this she menstruated irregularly, often every two weeks. Within the past two years her condition has grown progressively worse. She has lost a great deal of blood and suffers constantly with headaches, breathlessness upon slight exertion and swelling of the ankles.

Physical examination reveals a strikingly anæmic woman. She is so anæmic that the facial telangiectases, though numerous, are only to be seen upon close inspection. Scattered over her face are many small telangiectases ranging from a pin point to a green pea in size. They are especially numerous upon the ears and lips. Upon the edges and dorsum of the tongue, the hard palate and the gums of the lower jaw are numerous telangiectases. Scattered over the nasal mucous membrane are several bright red telangiectases. Upon the pads of the fingers and under the nails many small purple spots are visible. The conjunctiva of the right lower lid bears a bright red telangiectasis the size of a match head. The eye grounds are remarkably pale, but otherwise normal. Physical examination reveals nothing further of interest.

She has 1,500,000 red cells; 3000 white cells; and 15 per cent hæmoglobin. Her coagulation time is seven minutes.

Differential count as follows:

Polymorphonuclear neutrophiles	70.8%
Polymorphonuclear eosinophiles	2.5
Small mononuclears	17.4
Large mononuclears	5.6
Myelocytes	0.0
Normoblasts	0.0
Transitionals	3.6
Unclassified	1.6

There is slight poikilocytosis and anisocytosis.

Case II.—John F. R., aged 33, single.

The patient is a son of Mrs. Margaret R. (Case I).

Personal History.—He is not subject to recurring epistaxis. Since the age of 20 he has been greatly annoyed by severe hemorrhages from telangiectases which are numerous upon his lips and tongue. It is not uncommon for him to injure one of the labial or lingual telangiectases while eating, and thereupon blood actually spurts from the injured spot and further progress with the meal is rendered impossible. He has also been seriously hampered in his work as a fireman because of profuse hemorrhages from two telangiectases situated under the nail of the left middle finger. The history of their development is significant. Two years ago he ran a large splinter under the nail; suppuration ensued and the nail eventually came away. When a new nail finally grew two purple spots the size of rice grains were observed to have formed under it. Upon the slightest injury to the nail a surprisingly profuse hemorrhage results. He is compelled to wear a leather cot upon the finger constantly. He suffered from hemorrhoids for several years, finally having them removed by radical operation. The hemorrhages of which he complains are usually from the lips, tongue and left middle finger tip, occasionally from the nose, and always as a result of slight traumatism.

Physical Examination.—The patient is a robust, healthy man, without lesions other than those of the cutaneous capillaries about to be described.

Scattered over the patient's cheeks are several violaceous telangiectases ranging from a pin point to 3 mm. in size. Upon both lips, especially at the muco-cutaneous junction of the lower lip, are about twenty purple, slightly raised telangiectases. Scattered over the tip of the tongue are several cherry-red telangiectases, and two similar spots are present upon the upper gums. It is these telangiectases which bleed so profusely when injured. No telangiectases are to be seen upon the nasal mucous membrane. Under the nail of the left medial finger are two violaceous spots each about 2 mm. in diameter. There are several pin-point spots scattered over the tips of the fingers of both hands. The patient, however, bleeds only from the spots under the finger nail. He does not bleed freely from cuts nor do ecchymoses follow bruises. He has never to his knowledge had hematuria or melena. His joints are never swollen or painful. The quantitative estimation of his blood cells reveals no abnormality. The coagulation time is six and a half minutes (Boggs' instrument).

Case III.—Theodore R., aged 32, married.

The patient is a son of Mrs. Margaret R. (Case I).

Personal History.—He is a stone-cutter by trade, working entirely out of doors, and has a well-marked alcoholic history, "drinking when he has the money." All his life his nose has bled very easily, though never causing serious trouble. As long as he can remember he has had small red spots upon his lips and face and these have always bled profusely when injured. During the past three years the spots have increased greatly in size and number. Each year has added its crop of telangiectases until now his face is thickly studded with them. He does not bleed excessively from cuts nor are there any symptoms suggestive of hemophilia. He, like his brother, has suffered for several years from troublesome hemorrhoids; otherwise he is in the best of health.

Physical Examination.—The patient's face presents a truly remarkable picture. Scattered over the cheeks, ears, lips and tongue are more than one hundred telangiectases. These range in size from a pin point to a green pea and vary in color from cherry-red to dark purple. The smaller the spots the redder the color. The spots upon the tongue are scarlet red (Fig. 1).

As one observes more closely, stretching the skin the while, the entire capillary bed work of the skin of the face is seen to be dilated so that the capillaries, normally invisible, are readily discernible. No telangiectases are to be seen within the nasal cavity, though here too the capillaries are distended. There are several violaceous spots upon the finger tips.

His red cells number 5,200,000; white cells, 7300; hæmoglobin, 100 per cent. Coagulation time, six minutes (Boggs' instrument). No poikilocytosis or anisocytosis of the erythrocytes. Except for the lesions described, the patient is physically robust.

Case IV.—Mary R., aged 18, single.

The patient is a daughter of Mrs. Margaret R. (Case I).

Personal History.—Among the earliest of her childhood recollections is the fact that her nose frequently bled. As the years have passed she has been more and more annoyed by epistaxis until now scarcely a day passes that her nose does not bleed several times. The hemorrhages are frequently spontaneous or the result of insignificant traumatisms. It is not uncommon for her to awaken at night and find pillow and night clothes wet with blood. She does not bleed from the lips or mouth. Cuts do not bleed unduly. Several teeth have been extracted with only normal consequent bleeding, and recently both tonsils were removed by a thorough dissection, the patient showing no abnormal tendency to hemorrhage. No melena or hematuria—in short, no symptoms whatsoever of hemophilia. The patient suffers almost daily with severe headaches and frequently feels weak and exhausted. Palpitation and breathlessness are experienced upon sudden exertion. The ankles and feet are often swollen. Menstruation is irregular and profuse, often every two weeks. Quite recently the patient was admitted to the Johns Hopkins Hospital, suffering with acute tonsillitis, endocarditis and mild acute articular rheumatism.

Physical Examination.—The patient is very pale. Here and there upon the face are small pin-point telangiectases. Upon the lower lip are several violaceous telangiectases ranging from a pin point to a pin head in size. Upon the dorsum of the tongue there is a brilliant red telangiectasis the size of a match head. The small vessels around the nasal orifice are greatly dilated. Upon dilating the left orifice with a speculum the nose began to bleed at once, apparently from injury to small dilated capillaries. Examination of the mucous membrane of the septum revealed numerous small telangiectases, some raised above the surface of the surrounding mucous membrane and of a darker color. Similar telangiectases were visible on the mucous membrane of the turbinates. There can be no doubt that these telangiectases are the

cause of the epistaxis. The patient has upon several occasions come to have the nose bleed checked and the hemorrhage was each time seen to come from one of these spots. Upon the pads of the fingers and under several of the nails are small bluish spots. None of these has ever bled. There are no telangiectases elsewhere upon the body. Except for a double mitral lesion, the patient is physically normal.

Blood examination as follows: erythrocytes, 3,236,000; leucocytes, 11,600; hæmoglobin, 68 per cent. Coagulation time, six minutes (Boggs' instrument).

Differential count:

Polymorphonuclear neutrophiles	84.0%
Polymorphonuclear eosinophiles	1.0
Small mononuclears	11.5
Large mononuclears	3.5

No myelocytes; no normoblasts, and no mastcells. No poikilocytosis; slight anisocytosis.

The treatment of this case has been most encouraging. All the visible telangiectases within the nose have been destroyed with chromic acid (followed by a neutralizing alkali) and the patient's general condition improved by fresh air, nutritious food, iron and arsenic. She is now earning her living and enjoying life.

CASE V.—John R., aged 8.

He is the son of Theodore R. (Case III).

His case is of peculiar interest, for he has the rather equivocal distinction of being the youngest subject in whom the disease has been observed.

Personal History.—His mother states that he frequently bleeds from the nose. A slap on the face or a sudden jerking of the head suffices to produce epistaxis. Often the child awakens from sleep with the nose bleeding. Otherwise he has been a robust, healthy child.

Physical Examination.—Upon the lower lip at the mucocutaneous junction are two small red telangiectases, which I believe to represent the earliest appearance upon the face of these lesions so highly characteristic of the disease. Within the nasal mucous membrane numerous dilated capillaries are visible, though nowhere so grouped as to form telangiectases. No telangiectases are visible elsewhere upon the body.

Of the fourteen individuals comprising the last four generations of this family, nine have been subject to hemorrhages, while five have escaped. Males and females have been impartially affected.

I am much indebted to Dr. G. L. Taneyhill, Jr., for kindly referring to me this second series of cases.

FAMILY XV (Hanes, 1908).

Epistaxis in four sisters; multiple telangiectases, affecting chiefly the mucous membranes; no symptoms of hemophilia.

CASE I.—Miss Mary D., aged 46.

Family History.—The patient's father died at the age of 74 with pneumonia. He suffered from youth with recurring epistaxis and during the later years of life his nose bled every day. The patient states that he had numerous red spots upon his face and lips. Her mother was not subject to nose bleed. There were nine children in the family; three died in infancy, and one at the age of 27 during childbirth. This latter sister bled profusely and frequently from the nose. Five of the family are living, three females and two males.

Personal History.—Throughout the patient's childhood and youth she suffered extremely with severe epistaxis, which frequently necessitated plugging of the nostrils. Every day, often three or four times daily, the nose would bleed and as a result she became very weak, pale and incapacitated for any work. Sudden exertion, such as running up stairs, excitement or even bending down for any length of time caused nose bleed. About eighteen months ago, at a time when frequent hemorrhages had much reduced her strength, she developed an endocarditis, for which she was treated by Dr. G. L. Taneyhill, Jr. Since this attack the patient has been in fair health, though short of breath upon exertion and subject to palpitation and swelling of the ankles. The nose bleeds almost every day. With the exceptions noted, she has enjoyed good health. She does not bleed with abnormal freeness from cuts; has never had hematuria or melena to her knowledge. Injuries do not produce ecchymosis, and her joints have never been swollen or painful.

Physical Examination.—The patient is pallid and poorly nourished. Scattered over the face are numerous small dilated veins which here and there fuse to form purple telangiectases. These are most numerous under the eyes and at the bases of the alæ nasi. Upon the conjunctiva of the right lower and of the left upper lid there is a single small bright red telangiectasis. Upon both lips there are several quite typical telangiectases and the tip of the tongue is thickly beset with small cherry-red telangiectases. There are about a dozen similar spots upon the hard and soft palate. It is upon the nasal mucous membrane, however, that the telangiectases seem to have reached their maximum development. The resulting picture is truly remarkable, for at least a third of the nasal mucous membrane is the seat of bright red telangiectases. These are especially large and numerous on the anterior part of the nasal septum, though present to a lesser degree upon the mucous membrane of the turbinates and alæ nasi. They can be seen on the septum without the aid of a speculum. A crust of blood was seen surmounting one of the septal telangiectases upon one examination, and the patient said she had bled only a few hours before from that nostril. Under several of the nails there are small pinkish telangiectases, none of which have ever bled. She is elsewhere free from telangiectases and, with the exception of a well compensated mitral insufficiency, is apparently physically sound.

Blood examination: erythrocytes, 4,234,000; leucocytes, 5000; hæmoglobin 75 per cent. Differential count reveals no abnormality. Slight anisocytosis; no poikilocytosis.

CASE II.—Miss Emma D., aged 26. The patient is a sister of Miss Mary D. (Case I).

Personal History.—Her nose has bled almost every day "as far back as she can remember." The bleeding is seldom very profuse and has never required surgical interference. Unusual exertion, excitement or a too-vigorous use of a handkerchief causes epistaxis. The epistaxis has been her only symptom and she has been quite free from any manifestations of hemophilia.

Physical Examination.—There are two quite definite telangiectases on the left cheek and ten or twelve scattered over the lips. Upon the tip of the tongue are numerous bright red telangiectases. The vessels of the fauces and pharynx are noticeably dilated, and projecting downward from the nasal pharynx is a blood-stained strand of mucus. The nasal mucous membrane presents much the same picture as that seen within the nose of Miss Mary D., except that the telangiectases are not so numerous or so large. Upon one examination recently blood crusts were present within the right nostril and a slight oozing could be seen from one of the septal telangiectases. The body is elsewhere free from telangiectases and the other organs apparently healthy.

CASE III.—Miss Ida D., aged 28. Patient is a sister of Mary and Emma D.

Her personal history is but a repetition of that of Miss Emma D. Her nose bleeds two or three times weekly, but never very

severely, nor does she bleed from other parts of the body. She has never had any symptoms indicative of hemophilia.

Physical Examination.—There are no facial telangiectases, but upon the lips and tip of the tongue are several cherry-red telangiectases. The nasal mucous membrane is likewise affected, but very slightly; only a few small red telangiectases are to be seen and these upon the septum, anteriorly. There are no telangiectases upon other parts of the body and she is apparently in splendid health.

The two brothers, William, aged 34, and Edward, aged 38, are practically free from the disease. Both state that their noses bleed when they catch cold or injure the nose at all severely. Neither of them has telangiectases.

To Rendu, who in 1896 described the association of epistaxis with multiple telangiectases of the skin and mucous membranes, belongs the credit of having first recognized the syndrome as the manifestation of a distinct and separate disease. There exist, however, in the literature several incompletely reported cases which anyone familiar with the disease will, I believe, unhesitatingly accept as instances of multiple telangiectases causing hemorrhages. The interest which attaches to the growth of our knowledge of this peculiar malady justifies the review of these cases in some detail.

FAMILY I (Babbington, 1865).—*Recurring epistaxis in five generations of same family; impartial transmission through males and females; no negative or positive mention made of the presence of telangiectases.*

"Mrs. L. was during all her whole life and up until the period of her marriage subject to frequent and violent epistaxis. She had four children, two of whom, a male and a female, likewise had habitual and severe epistaxis. The male died of the disease; the female had six female children of whom three suffered from epistaxis during all the whole period of their lives. One of these children, who is the patient, Mrs. K., has six children; two of them, females, have habitual and severe epistaxis. The elder has a son similarly affected. One of Mrs. K.'s sisters has two sons, both subject to violent recurring epistaxis. One of the sons is married and one of his children, a boy of six, has epistaxis. Mrs. K.'s other sister had a daughter, now dead, who suffered with violent epistaxis. Thus, epistaxis has occurred in five consecutive generations."

FAMILY II (Legg, 1876).—*Family history of epistaxis in three generations; presence of developmental telangiectases upon face and trunk; no convincing personal history of hemophilia.*

A musician, aged 65, came complaining of nose bleed to which he had been subject since boyhood. There was no history of hematuria or rectal bleeding, but the patient had shown a tendency to bleed profusely from traumatic causes. His mother was said to have died from loss of blood and dropsy. Of his four brothers and three sisters only one, a girl, was subject to epistaxis. Of his own children, three of whom are living and three dead, a son 27 years of age and a daughter 22 years of age, suffer from epistaxis.

The patient presented numerous small nævi scattered over the face, forehead and various parts of the trunk. They were not congenital, but had developed about the 41st year of life. Since the age of 23 he had been subject to painful swellings of joints, recurring at regular intervals, affecting chiefly the great toe where the swelling first appeared, but also occasionally the great joints. No tophi. Violent fits of anger, as well as excessive beer drinking, lead to epistaxis. When seen he had been suffering from the bleeding every day for six weeks.

The two following reports are literal translations of Chiari's observations:

FAMILY III (Chiari, 1887).

CASE I.—*Recurring epistaxis in four generations of one family; multiple telangiectases upon skin, nasal and buccal mucous membranes; confusion with hemophilia.*

At the end of January, 1885, two sisters came to the clinic to be treated for frequently recurring nose bleed.

A. S., aged 40, and E. R., aged 36, stated that their grandmother and her brothers suffered from childhood with oft-repeated and severe nose bleed, but nevertheless had lived to ripe old ages, several up to 70 years of age. Their mother, who likewise from childhood bled from the nose, died at the age of 47 with dropsy, which developed apparently after a long period of nose bleed. The bleeding on the average became less frequent with advancing years. Two brothers and one sister suffered likewise from childhood with severe nose bleed. One sister, 38 years old, has so far recovered from the tendency to nose bleed that it occurs now only at the time of the menses and is then insignificant. Both first-named sisters have bled since childhood from both sides of the nose. As a rule, the bleeding extends through many weeks, whereupon some weeks without bleeding follow. One of them once bled for a long time from the gums.

Both of these sisters have upon their faces many flat, or only slightly raised, telangiectases, ranging in size from millet seeds to lentils, some of which have bled following slight traumatisms. There are similar cherry-red spots sparsely scattered over the upper part of the trunk. Upon the nasal septum and upon both under and middle turbinates, extending far back, one sees numerous sharply bordered, slightly raised spots of intense cherry-red color, varying from a millet seed to a lentil in size. They bleed upon slight injury. Upon the tongue and mucous membranes of the lips are similar spots which look like telangiectases. The mucous membranes are pale. One of the sisters has four children of whom only the youngest, four years old, bleeds from the nose. The other sister has one six-year-old boy who has suffered four years from nose bleed. Both sisters state that they never bleed very freely from cuts.

"It is obvious," the author remarks, "that in both of these patients we have to do with a slight grade of hemophilia, which manifests itself principally through the occurrence of nose bleeding from many cherry-red extravasations. In addition, there are many long-existing telangiectases which always retain their cherry-red color. I could not observe through several weeks study actual changes in the first-mentioned cherry-red spots, as is the rule with blood extravasations. One could think perhaps of multiple telangiectases of the mucous membrane which are hereditary in a family, and really this was my first view of the matter. However, a succession of observations upon a second bleeder family (Case II) permitted me to see the matter in another light."

FAMILY IV.

CASE II.—*Severe recurring epistaxis in three generations of one family; multiple telangiectases upon the skin and mucous membranes.*

"Prof. Nothnagel sent me a patient named Goldschmidt, who had suffered since childhood from epistaxis which had often assumed a very dangerous character. Her father had the same trouble. The patient, about 30 years old, was very anæmic and complained that frequently small red spots came upon her hands, tongue and lips. Upon examination there were seen upon the right cheek several cherry-red spots the size of lentils, which disappeared upon pressure, but soon returned. Similar spots and small nodules are present upon the tongue and lips. The pharyngeal and tracheal mucous membranes are pale. In the nose one sees upon both sides of the septum and the lower and middle

turbinates, extending far back, large numbers of round and stellate, cherry-red, flat or somewhat raised spots.

"The patient's sister, Mrs. Wasmuth, has likewise suffered from childhood with severe nose bleed, but never so severely as Mrs. Goldschmidt. She is also much stronger. Upon her tongue and within the nose the same sort of spots are seen as described above, but smaller and less numerous. Some weeks before the patient was seen there had formed on her under lip a pea-sized bluish red infiltrate, and upon the nose and on both cheeks several small red spots had appeared. Such spots and infiltrates had often appeared formerly, but had always disappeared after some weeks. She stated that her paternal aunt suffered with severe nose bleed and many large red spots were present upon her forehead. Mrs. Wasmuth had three children, one of whom died some years ago from severe nose bleed. Her 12-year-old son, whom I likewise saw, suffered with nose bleed and showed upon the left septum dark red spots the size of lentils, which I destroyed with the loss of much blood by the galvano cautery. Upon the nasal septum of her 10-year-old daughter, who bled much less from the nose, I saw a long venous blood vessel and destroyed it. The hemorrhages ceased after this. In the case of the boy, however, the same methods yielded no improvement.

"I am constrained, therefore, to designate the spots upon the sisters, S. and R. (Case I) blood extravasations which, however, changed only slightly; a thing that is not uncommon in hemophilia."

These cases are unquestionably classical examples of telangiectatic hemorrhage. The diagnosis of hemophilia is obviously incorrect.

Chauffard in 1896 reported the following case, in which there is no family history of hemorrhages:

Recurring hemorrhages from telangiectases of the skin and mucous membranes; history of former hemophilic symptoms.

"The patient whom I have the honor to present to the society appears to me afflicted with a disease differing in many ways from that curious affection so rare in France, namely, hemophilia. Her history deserves a detailed report.

"Madam C. is aged 50 and has never suffered from any other pathological conditions other than those of hemorrhagic origin which we are about to study. Not only is her personal history negative, but one cannot find any hemorrhagic taint or appreciable nervousness in her family. Her father died of hemiplegia. Her mother, four brothers and one sister met accidental deaths. There is no trace of hemophilia in collateral branches of the family.

Personal History.—"The patient has menstruated from the age of 15 regularly, freely and without menorrhagia. Her marital history is negative; no children. The menopause occurred uneventfully at the age of 47. At the age of 20, while stooping one day, the patient felt something warm run down her forehead which proved to be blood produced by a hemorrhage at the edge of the scalp in the median region a little above the forehead. The bleeding ceased spontaneously at the end of half an hour. A similar bleeding from the edge of the scalp occurred twelve years later, which was so severe as to require the attentions of a physician. About one year after the first hemorrhage from the border of the scalp, a palatine hemorrhage occured which lasted about seven hours. On the inferior surface of the second left toe is a little violet point about the size of a millet seed. Bleeding from this point, either spontaneous or from the slight trauma incident to walking, is frequent and often abundant enough to soak the foot and stocking. Hemorrhages occur now and then from the middle finger of the left hand and from the right thumb. The blood comes from the groove beside the nails and one can see at these points little ecchymoses. I have demonstrated for myself these digital hemorrhages. Besides the two hemorrhages from the border of the scalp the patient has bled from the right eyebrow, where one notes a little red point at the junction of the outer and middle thirds. At another time the patient bled freely from the left ear.

"Epistaxis is very frequent, lasting from four to five hours, sometimes from one nostril, sometimes from both. Upon five occasions it has been necessary to pack the nasal fossæ. She has frequently bled from the palate. The last of these hemorrhages, which I was able to follow, lasted about eight hours and weakened the patient very much. She bleeds occasionally from the tip of the tongue, and at the time of one such hemorrhage the patient noted small subconjunctival ecchymoses in the left eye, which, however, never bled. There has been no hematuria or melena.

"All of these cutaneous and mucous hemorrhages were spontaneous. Divers traumatic hemorrhages have occurred. Ten years ago, following the extraction of a lower molar tooth—the only tooth ever extracted—a grave hemorrhage occurred. At this time the slightest pin prick bled freely and a blow, however light, made an ecchymosis. In order to avoid troublesome bleeding from the gums the patient was compelled to renounce brushing her teeth; she had to content herself with softly cleaning them with a fine thread.

Physical Examination.—"The patient is a small woman and her subnormal stature is explained by a very pronounced right scoliosis which began about the age of 15 and has steadily progressed. Beyond a definite degree of arterio-sclerosis, no other abnormalities are made out. The urine is negative. The patient is pale and tired-looking with a slightly earthy tinge to the complexion. In the depth of the anæmic skin many red lines are to be seen disseminated over both cheeks, brow and auricles of the ears. The patient was ignorant of these little sanguineous blotches and could not say even approximately when they began. The objective characters of these different spots are identical. For example, with a lens one sees that each red spot is formed by one or more little dilated venules arborescent or plexiform, forming little nævi in miniature. Each of these capillary telangiectases seems very superficial and the contained blood is brilliant red, approaching the arterial aspect always present in the spontaneous hemorrhages of the patient. These varicosities are most numerous on the right cheek and left ear. They are very numerous at the muco-cutaneous junction of the lower lip. On the buccal mucous membrane numerous similar telangiectases are present. Many bright red punctate arborescences are visible on the palatine vault, especially upon the hard palate. It was at the location of the principal one of these spots that I recently saw a continuous hemorrhage which lasted eight days. At the tip of the tongue there are a dozen punctate points as large as the head of a pin. There are several similar spots on the sublingual mucosa. The blood examination revealed the following: Red blood cells, 3,689,000; white blood cells, 14,819; hæmoglobin, 65 per cent. No poikilocytosis or anisocytosis.

"Under the microscope a reticulum of fibrin was seen to form in from ten to fourteen minutes."

Chauffard rather dubiously accepts this case as one of hemophilia, noting, however, the absence of arthropathies, hematuria and melena. As a compromise he suggests the rather fanciful name of "cutaneous hemophilia." He is at some pains to prove that the condition is not one of hysteria, a labor which I think most readers will find supererogatory. He concludes that the telangiectases are merely stigmata of an atypical form of hemophilia, recognizing, however, that the hemorrhages always took place from the telangiectases. Whether or not those symptoms of hemophilia, said by the patient to have

been present at one period of her life, were in evidence while the patient was under observation, does not appear.

With the publication of the following excellent description by Rendu in 1896, the stigma of hemophilia, or worse still, of hemorrhagic diathasis, was removed from the disease and the path cleared for subsequent scientific observation.

FAMILY V (Rendu, 1896).

Severe recurring epistaxis; family history of nose bleed; no symptoms of hemophilia; marked anæmia.

"I have observed in my service a disease which in certain features resembles a case of hemophilia reported by M. Chauffard. The patient's name is S., aged 52 years. He is a large, well-developed man, but pale and tired-looking. The skin is slightly yellow, almost icteric in hue. He seems very weak and the least exertion causes palpitation. When he bends and rises quickly he experiences a feeling of vertigo. His appetite is good and he has no fever. The appearance of anæmia and debility is due to a double series of symptoms. For two months he has been subject to an intermittent diarrhœa which has greatly exhausted him, but which has never shown the character of a dysentery.

"The abdomen is negative. The predominating symptom at present is a daily recurring epistaxis. During the past three weeks his nose has bled once, often several times, daily. The hemorrhages usually begin in the early hours of the morning and he has frequently been awakened by the apparently unprovoked epistaxis. His nose rarely bleeds during the day and only exceptionally while out of doors. The hemorrhages are, as a rule, not very profuse, though frequently amounting to 200 or 300 cc. It is this constant loss of blood which has produced the anæmia, prostration, yellow tinge to the skin, palpitation and vertigo. Physical examination does not reveal any constitutional cause for the epistaxis. The heart, arteries and kidneys are normal. In brief, we are confronted with an epistaxis of hidden causation, an essential epistaxis.

"Upon searching into the personal antecedents of the patient facts are adduced which, if they do not point to a true hemophilia, yet indicate the presence of a hemorrhagic tendency. His father died of dysentery with repeated crises of melena at the age of 55. His mother was subject to recurring epistaxis. One brother also suffered from abundant and repeated epistaxis. He himself began to bleed from the nose at the age of 12, and during his youth he suffered constantly, though in an intermittent fashion, therefrom. This disposition has become notably aggravated with advance in years and since the age of 35 the hemorrhages have been very marked. The bleeding is always from the nose. He has never had hematuria or purpuric spots on the body. His gums do not bleed nor does he bleed abnormally from cuts. Two teeth have been extracted without any notable consecutive hemorrhage. This is not, then, a condition of true hemophilia, notwithstanding the frequent repeated epistaxis. One particular which resembles exactly the observation of M. Chauffard explains perhaps the singular localization of the hemorrhages and their frequent recurrence. There are upon the skin of the nose, the cheek, the upper lip and the chin small purple spots ranging in size from a pin head to a lentil. They are true cutaneous angiomata produced by dilatation of the superficial vessels of the skin. They pale on pressure, but do not disappear. Some angiomata of the same nature are scattered over the neck and chest. They do not exist on the arms or legs. This distribution is not limited to the skin. They extend also to the mucosa. There are small vascular dilatations, true telangiectases, on the inner surface of the lips, cheeks, upon the tongue and on the soft palate, with the identical characters of those on the skin, but having a more vivid coloring due to the thinness of the epithelium. On the nares we do not find these punctiform angiomata, but it is not unreasonable to suppose that in the nasal cavity and nasal fossæ the same exist. One could thus understand why it is always the nasal mucosa that is the seat of these hemorrhages so frequent and so abundant. What seems to prove that a local anatomical lesion explains this pseudo-hemophilia is the fact that general medication, astringents and tonics, in no wise affect the occurrence of the hemorrhages. During the first three days I confined myself to the general treatment of the patient, but the epistaxis continued unabated. It stopped, on the contrary, in short enough time, on employing an application directly to the mucosa. After the first day the loss of blood was insignificant and the epistaxis which occurred on the following night was infinitely less severe than that of preceding nights; after the third day the hemorrhage never reappeared. This result was accomplished by having the patient use several times a day the following application upon the nasal mucous membrane: antipyrin, 5 gm.; tannin, 1 gm.; powdered sugar, 10 gm."

Admitting the excellency of Rendu's observations, it is, however, to a paper by Osler, published in 1901, that our growing knowledge of recurring hemorrhage of telangiectatic origin is due. A glance at the appended bibliography will render obvious the striking impetus imparted to the study of the disease by Osler's communication.

FAMILY VI (Osler, 1901).

CASE I.—*Attacks of epistaxis from boyhood; seven members of the family subject to it; telangiectases on skin of face and mucous membranes of nose and mouth.*

George B., aged 57; occupation, sailor.

Family History.—The patient's father died at the age of 69 from stone in the bladder. The son says his father was all his life subject to bleeding from the nose. The hemorrhages were frequent, generally every day No other members of his father's family, so far as he knows, suffered from epistaxis, and his mother was likewise free from it. Of the patient's three brothers, one bleeds from the nose and has numerous red spots upon his face (see Case II). He had two children, both of whom were in childhood subject to recurring nose bleed. In the third generation the patient has one child, aged 13, who bleeds occasionally from the nose. In the fourth generation a girl, granddaughter of the patient's sister, has had epistaxis frequently.

Personal History.—The patient has been a sailor for 43 years; is a moderate drinker; had syphilis 30 years ago. The epistaxis began about his tenth year and was of almost daily occurrence, though never very severe. About the age of 37 the epistaxis increased in frequency and severity and for three years he was unable to work because of the prostration produced by the bleeding. He has on two occasions bled profusely from spots upon the face. He has frequently been anæmic, with swelling of the feet and shortness of breath. He was recently operated upon for hemorrhoids of thirty years duration. There is no history suggesting hemophilia.

Physical Examination.—The patient was a large-framed man; he was short of breath; face swollen and anæmic. He had bled from the nose up to the time of admission and there was a clot of blood projecting from the left nostril. "The face presented a very unusual appearance, owing to the large number of dilated venules and capillary and venous telangiectases." The telangiectases were most numerous on the ears, cheeks and lips near the muco-cutaneous junction. They were very numerous upon the nasal mucous membrane, especially upon the cartilaginous portion of the septum. Except for a number of telangiectases upon the tip and along the edges of the tongue, the mucous membrane of the mouth appeared normal. The legs were swollen to the middle of the calves. Urine negative. Blood: erythrocytes,

2,908,000; leucocytes, 8000; hæmoglobin 15 to 20 per cent. Coagulation time, with Wright's tubes, 5½ to 7 minutes.

CASE II.—*Epistaxis from childhood; telangiectases of skin and mucous membranes; bleeding from some of the spots; cancer of the stomach; death; autopsy.*

William B., aged 55, sailor. The patient's family history was given in Case I.

Personal History.—Patient began to bleed from the nose very early in life and this has ever since been a source of constant annoyance, on several occasions causing extreme anæmia and weakness. The spots on his face and lips have bled occasionally following injury, but the nose bleeds without apparent provocation. Of late years bleeding has become less frequent. He has led the irregular life of a sailor and has been at times a very heavy drinker.

Physical Examination.—The patient was pale and sallow. Scattered over the face were a number of telangiectases, most numerous on lips, cheeks and ears. They were also present upon the tongue and upon the mucous membrane of the nasal septum. The patient had a large tumor mass in the abdomen, evidently a new growth of the stomach. The blood examination showed: erythrocytes, 4,488,000; leucocytes, 7400; hæmoglobin, 71 per cent; coagulation time 9 to 11 minutes, reduced to 4 minutes by calcium chloride. The patient died in the hospital and the following anatomical diagnosis was made at autopsy: "Cancer of the stomach, mesentery and omentum, liver, retroperitoneal glands, lungs and brain. Angiomata of the mucous membrane of the nose and of the stomach. In the stomach there were a dozen round foci, each 3 mm. to 4 mm. in size, which at first looked like ecchymoses, but were dilated venules and capillaries." Sections of the septum of the nose showed large dilated veins just beneath epithelium.

CASE III.—*Recurrent epistaxis from tenth year; multiple telangiectases of the skin and mucous membranes of nose and mouth.*

M. W. C., aged 49. Admitted to the Johns Hopkins Hospital, complaining of epistaxis, which had recurred at short intervals from his boyhood.

Family History.—So far as patient knows he is the only member of his family who has ever suffered with recurring nose bleed.

Personal History.—When ten years old he began to have frequent attacks of epistaxis of such severity as to render him weak and anæmic. The bleeding would begin without provocation as a slight oozing and end in a very free hemorrhage. For thirty-nine years, except for brief periods of improvement, he has constantly suffered from frequent epistaxis. He has been an active business man and the bleeding with the constant weakness has greatly interfered with his work. The hemorrhages have often been so profuse as to necessitate the plugging of the nostrils. When a lad he noticed red spots upon his face and hands; they have grown more numerous with advancing years, especially within the past seven or eight years. He has bled perhaps twenty-five times from the spots on his hands.

Physical Examination.—Patient was a well-nourished, but anæmic-looking, man. The blood picture showed: erythrocytes, 3,460,000; hæmoglobin, 38 per cent; marked poikilocytosis. A differential count was as follows: polymorphonuclears, 80 per cent; small mononuclears, 10 per cent; transitionals, 9 per cent; eosinophiles, 1 per cent. Coagulation time, with Wright's tubes, 2½ minutes.

"The telangiectases were most numerous on the face, which was much disfigured by them (see Fig. 3). On the right cheek there were twenty-five, some of which projected slightly beyond the skin as purplish spots from 1 mm. to 4 mm. in diameter; the largest presented a stellate arrangement of veins. On the left cheek there were about twenty, several with quite large veins passing to the center. While most of them were quite superficial, there were others subcutaneous and bluish in tint. On the lower lip the edge at the skin was closely set with them, and on the mucous membrane of the left side there was an angioma the size of a split pea. On the upper lip there were many small ones, and in the very center, just at the raphe, there was a large, deeply-seated, blue one. Scattered over the forehead were eight or ten, most of them purplish red, one or two near the margin of the scalp, deep-seated and blue. Here and there on the scalp a few could be seen. On the upper surface of the tongue there were five or six, and several on the under surface, all of them small and very bright red in color. There were none on the pharynx, but there were a number on the inner surfaces of the cheeks and on the gums, which were not swollen. The skin of the ears presented numerous pin-point telangiectases, giving to it a very peculiar appearance; the spots were about the size of the central point of a flea bite.

"Scattered over the back, chest and abdomen were two or three dozen bright red angiomata, none of them more than 2 mm. or 3 mm. in diameter. Several of them project, and one or two are almost pedunculated. The arms and legs are practically free. On the hands, however, there a good many angiomata, nearly all small and pin point. They are scattered over the fingers and palms, particularly about the pads of the fingers.

"Dr. Warfield made several careful examinations of the nose, and reported that on both sides of the septum there were numerous scattered angiomata, very similar in appearance to the smaller ones on the cheeks, and tortuous veins could be seen radiating from their centers. With the exception of these spots the mucous membrane of the nose and throat looked normal."

FAMILY VII (Osler, 1907).

CASE IV.—*Hemorrhages from nose and mouth since tenth year. Multiple telangiectases upon the skin of the face, ears and lips.*

The patient is a physician, aged 53.

Family History.—The patient's grandfather, father and one sister had red spots upon their faces, and his son, 20 years of age, began to have frequent attacks of epistaxis at the age of 16, which have never been very profuse, but are quite annoying. He has no spots upon his face.

Personal History.—The patient had from his tenth year bled with great profuseness from his nose and from red spots upon his face. Occasionally hemorrhages had taken place from spots upon his head and arm and frequently from the mucous membrane of the mouth. The hemorrhages have grown more severe with advanced age and "within the past year bleeding has been very profuse, scarcely a day passing without loss of blood." The frequent bleeding has been a source of constant distress to him and, though himself a physician of large experience, the malady had not yielded to his own efforts, nor to those of many specialists whom he had consulted. He regarded the condition as one of hemophilia.

Physical Examination.—There were numerous telangiectases upon the skin of the face, ears and lips. No mention is made of an examination of the mucous membranes of the nose and mouth, but the presence of telangiectases may be inferred in the absence of a negative report and in view of the fact that "though usually bleeding from the nose, he had bled from the spots on the skin of the face and on the head, once badly from a spot on the arm and very frequently from the mucous membranes of the mouth."

This case has been published by Coe as an instance of hemophilia and exhibited as a striking example of the efficacy of calcium lactate in the treatment of this disease. Coe's examination of the blood revealed; erythrocytes, 3,680,000; leucocytes, 5000; hæmoglobin 70 per cent. Slight poikilocytosis. No abnormality noted in a differential leucocyte count.

Dr. Brown Kelly's paper, in which he reports the two following cases, is a splendid addition to the subject, and its value

is greatly enhanced by the two colored plates which accompany it, and which are herewith reproduced by the author's kind permission. (Figs. 4 and 5.)

FAMILY VIII (A. Brown Kelly, 1906).

CASE I.—*Severe recurring epistaxis; multiple telangiectases of skin and mucous membranes; death at 48 from syncope induced by a prolonged epistaxis.*

A woman, aged 41, came in May, 1898, complaining of severe recurring epistaxis.

Family History.—She knew nothing of her grandparents. Her father died at the age of 62 in consequence of frequent bleedings from the nose. There were numerous red spots upon his face similar to those occurring upon the face of the patient. The patient has four uncles and one aunt, all of whom are exempt from the condition described. The patient's mother never suffered from epistaxis. A sister of the patient bleeds repeatedly from the nose and exhibits numerous red spots upon her face.

The patient has a daughter, aged 23, and a son, aged 20. The former bleeds from the nose and has red spots upon her face; the latter is not subject to epistaxis and has no spots upon his face.

Personal History.—At the age of 12 she began to bleed repeatedly and profusely from her nose and, with occasional periods of improvement, this persisted until her death, while under observation, at the age of 48. Death came suddenly from syncope induced by severe and persistent epistaxis. Reddish spots began to appear upon the skin of her face about her twenty-ninth year. The cheeks, ears, lips and finger tips were especially affected. After her thirty-eighth year the spots increased greatly in number and size, and the epistaxis at the same time became alarming. The onset of winter always caused marked exacerbation of the epistaxis, and this necessitated her staying in the house from October until March of each year. The weakness induced by the severe epistaxis frequently confined her to bed for several months at a time. The nose bleed was sometimes spontaneous, sometimes the result of slight trauma; hemorrhages from the cutaneous telangiectases were always traumatic in origin. There were no symptoms indicative of hemophilia.

Physical Examination.—The patient was a stout, well-developed woman. The face was sallow and presented numerous telangiectases, varying in size from a pin point to 3 mm. They were grouped especially over the cheek bones and upon the lobes of the ears. Scattered over the nasal mucous membrane were numerous telangiectases, especially well seen upon the middle and inferior turbinates in the septum, anteriorly. "Bright red dots, short lines and spider-like formations were present." There were three or four small red spots upon the dorsum of the tongue. The patient's condition grew progressively worse, until syncope, following prolonged epistaxis, terminated the scene in 1905, seven years after her first visit to Dr. Kelly.

CASE II.—*Frequent hemorrhages from lips, mouth and nose; multiple telangiectases upon skin of face and hands and mucous membranes of nose and mouth; blood picture of simple anæmia.*

The patient, aged 40, is a sister of Mrs. M., reported in Case I.

Personal History.—About the age of 17 the patient began to have hemorrhages from lips and tongue, occasioned apparently by the injury of small red spots present upon the lips and lingual mucous membrane. Since the age of 17 these red spots have increased progressively in size and number, and since the age of 27 similar spots appeared upon her cheeks and fingers. She is subject to occasional epistaxis, although the hemorrhages from her lips and tongue are more profuse and constitute her major complaint. The hemorrhages are frequently spontaneous, occurring when the patient is sitting quietly, or during the night when asleep. There is no periodicity in the occurrence of the hemorrhages; they may occur daily for a week and be absent throughout the following week. From October to March they are especially profuse and frequent, occurring almost every day. In summer the longest interval between bleedings is about a fortnight. There is no evidence of hemophilia.

Physical Examination.—Many telangiectases, varying in size from a pin point to a hemispherical elevation about 3 mm. in diameter, are present upon the face, lips, tongue and hard palate. They are scattered profusely over the nasal mucous membrane. Several are present upon the palms, the palmar aspect of the finger tips, and beneath the finger nails; one or two in exposed situations on the fingers often bleed. A few have lately developed on the scalp and occasionally give rise to bleeding when the hair is combed.

Examination of the blood reveals the following picture: erythrocytes, 3,500,000; leucocytes, 6150; hæmoglobin, 90 per cent. Differential count as follows: polymorphonuclears, 68.3 per cent; small mononuclears, 26 per cent; large mononuclears, 5 per cent; eosinophiles, .7 per cent. Poikilocytosis slight; no normoblasts.

In addition to the above two cases belonging to one family, Brown Kelly in 1908 reported the following instance, apparently non-hereditary:

CASE III.—*Multiple telangiectases limited to right side of head; severe epistaxis; large angioma of right cheek.*

Family History.—The patient, a woman, aged 35, is the eldest of the family. Her father, mother, two brothers, three sisters, as well as all other relatives, so far as she knows, are free from telangiectases and have no tendency to epistaxis or to bleed from cuts.

Personal History.—The patient has been subject to epistaxis from girlhood, but this became alarmingly severe only two and a half years ago. The telangiectasis, which first appeared was on the lower eyelid, she cannot say exactly when, only that it was "many years ago." Subsequently other telangiectases appeared on the cheek, nose and sclerotics.

Physical Examination.—"The telangiectases are confined to the right side of the face, the right nasal fossa, right half of palate and uvula and right faucial pillars. There are none elsewhere."

Dr. Kelly says in a recent letter: "From the brief description of this case you will see that it differs greatly from my other two, which conform to the ordinary type. Prof. Osler has examined the patient and regards the telangiectases as symptomatic of an angioma in the cheek. The presence of an angioma, of which I think there can be no doubt, accounts for the pulsation felt in the cheek and seen in the tonsillar region of the same side, and for the higher temperature and swelling of the affected cheek. The question arises: 'Have we in this case the same etiological factors as in typical cases of multiple telangiectases, but only localized, or, are the two affections distinct?'"

FAMILY IX (C. O. Hawthorne, 1906).

Marked family history of nose bleed; recurring epistaxis since childhood; telangiectases upon face and hands.

Woman, aged 49.

Family History.—The patient's father and one sister suffered from frequent nose bleed and had spots on their faces similar to those of the patient. She has nine children, all of whom are subject to recurring nose bleed.

Personal History.—Since childhood she has suffered from "bleeding at the nose." On one occasion it was necessary to plug the nostrils. Since her first pregnancy she has been aware of red spots on her face, and also on several of the finger tips of the right hand. There is one situated just under the free edge of the nail which has bled occasionally following slight trauma.

Physical Examination.—"A mere glance at the woman's face was sufficient to show a number of bright red telangiectases scattered over both cheeks, and a few were also seen on the fingers

of the right hand. None were recognized elsewhere, but as the patient came to the hospital merely as a friend of one of the patients and objected to further examination, the condition of the nasal and other mucous membranes could not be ascertained."

FAMILY X (F. Parkes Weber, 1907).

Family history of recurring epistaxis in three generations; development of facial telangiectases at the age of 42; progressively severe epistaxis; simple anæmia.

Jewess, aged 60.

Family History.—The patient's mother, who died at the age of 56, suffered from recurring epistaxis and had numerous red spots upon her face, similar to those on the face of the parent. Three sons and one daughter of the patient are subject to recurring nose bleed and two of the sons show multiple telangiectases on the skin, nasal and buccal mucous membranes. In the third generation two grandchildren of the patient suffer from repeated epistaxis. None of the family bleed abnormally except from the nose.

Personal History.—At the age of 42 the patient first noticed a red spot on her face and she thinks all the spots now present have developed since that time. A few years previous to this her nose began to bleed, on an average, every two weeks. Within the last two years, especially recently, the epistaxis has grown much worse. With the exception of nose bleed, she has never suffered from loss of blood.

Physical Examination.—The patient is a pale, rather fat woman, and she has a number of bright red angiomata distributed over the face, ears, lips, tongue, mucous membrane of mouth and conjunctival surface of all four lids. The telangiectases vary in size from a pin head to one measuring 5 x 7 mm. Several telangiectases are to be seen on the mucous membrane inside both nostrils. On the fingers and under the finger nails are several minute red telangiectases. There is slight œdema of the legs and the veins are varicosed. A blood count shows: erythrocytes, 2,833,000; leucocytes, 11,350; hæmoglobin, 45 per cent. Coagulation time, 5½ minutes, with Wright's tubes. Differential count as follows: polymorphonuclears, 42 per cent; lymphocytes, 45.2 per cent; intermediates, 7.2 per cent; large hyalines, 2.4 per cent; eosinophiles, 2.4 per cent; mastcells, .8 per cent. The red cells show slight poikilocytosis; no normoblasts.

Ophthalmoscopic examination reveals a small patch of chorioretinitis in the right fundus.

FAMILY XI (Phillips, 1908).

Recurring hemorrhages from nose and mouth in three generations of one family; multiple telangiectases of nose and buccal mucous membrane.

"The patient is a married woman, aged 56, who has since childhood suffered from bleeding from the mouth, and more lately from the nose. Her father suffers from violent epistaxis and bleeding from the tongue. Her sister died from hemorrhage of the gums. The patient has one daughter who has vesicular elevations on the tongue and has recently had epistaxis. Near the tip of the patient's tongue is a small red elevated patch which at times spurts out blood freely; there is a small one on the surface of the tongue and one speck behind an alveolus of the upper jaw which also bleeds freely at times. In the right nostril there is a much enlarged vessel seen in the 'locus Kiesselbachi'; on the left side some smaller red spots in the corresponding part of the septum; no lesions in the nostril, pharynx or larynx."

FAMILY XII (Waggett, 1908).

Severe epistaxis; multiple telangiectases of skin of face and mucous membrane of nose and mouth.

"The patient is a man, aged 55, married, but without children, a professional player of wind instruments. He is of robust build, but markedly anæmic, and gives a history of hemorrhage from the nose at very frequent intervals since about the age of 20. He has also had hemorrhage from the face and lips externally. The bleeding is neither better nor worse now than it has been throughout his life. The application of the galvano-cautery to the nose checked the epistaxis for a few weeks.

"He has a sister (not seen) who is stated to have the same symptoms. There is no other family history of importance. Dilated vessels are seen upon Kiesselbach's area on both sides, and it is from these that the epistaxis occurs. Telangiectases are visible on the middle turbinates, the tongue, the edges of the lips and upon the skin of the cheeks externally. Those upon the tongue, about ten in number, take the form of definite circular spots about the size of a millet seed, while on the lips they assume the shape of small hemispherical tumors. The coagulation time of the blood is prolonged, but the exhibition of calcium internally has had no effect upon the epistaxis."

FAMILY XIII (A. J. Ballantyne, 1908).

Family of eight; multiple telangiectases found in five of the six members examined.

The family were Hollanders of the respectable farming class. Attention was first arrested by the appearance of minute red spots on the palpebral conjunctivæ of two of the party, and it was then noticed that similar but larger and much more numerous spots were to be found on the lips and other parts of the skin and mucous membranes. Details regarding the various members of the family follow:

1. Francis van D., aged 63. A thoroughly healthy-looking man. No spots were visible on his skin or mucous membranes, and no history of illness could be elicited.

2. Teuntje, his wife, aged 56. Face and mucous membranes very pale. No emaciation, but looks somewhat old for her years. She has one small red spot on the conjunctiva of the right upper lid, several on the conjunctiva of each of the two lower lids, but none on the left upper lid. On each cheek there is an area covered with a sort of plexus of dilated capillaries, denser at some points than at others, but not forming actual nævoid spots. A somewhat similar condition is found at the centre of the dorsum of the tongue.

Several spots, small, round and of bright red color, are situated in and around the nostrils. On both upper and lower lips are a considerable number of spots of variable size and color.

The conjunctival spots were at first sight taken for small hemorrhages, but closer inspection showed that they were composed of little nævoid clusters of dilated vessels. Hemorrhages are much more commonly found in the bulbar conjunctiva, and these were confined to the palpebral conjunctiva. They were of rounded or quadrangular form, of bright red color, not more than 1 mm. in diameter, and caused no elevation of the surface.

The spots about the nose had the same characters, but were a shade larger.

The spots on the lips varied greatly in size and color. The smaller ones formed little discreet round points, 1 mm. or less in diameter, of bright red color, and with no elevation of the mucous membrane over them. The largest spots were as much as 3 mm. in diameter, of dark purplish color, and formed distinct elevations, some being as large as a split pea. Between these two sizes there were many gradations. Some of the larger ones appeared to have originated by the coalescence of smaller ones.

No history could be elicited of any illness, and she was not aware of any losses of blood which might account for her pallor. Her husband attributed her bloodlessness simply to old age.

3. Marcellus, son, aged 30, now in America, said to be healthy.

4. Gysbertje, aged 26. A tall, well-built, and well-nourished young woman. She has a "pasty" complexion, but does not look quite so pale as her mother. Each cheek shows from ten to fifteen small round dark red spots, unaccompanied by any elevation of the skin surface, and the exposed surface of each lip presents

about the same number of rather large spots. Others, of irregular shape, occupy the tip of the tongue, and there are several on the roof of the mouth. The conjunctivæ of all the lids show several spots like those described in the mother's case. One minute spot is seen under the nail of the fourth finger of the right hand.

The girl gave a history of rather frequent bleedings from the nose, and had been treated with iron for the past three years on account of "bloodlessness." There was no history of other losses of blood, or of illness of any kind. The father stated that she had only been bloodless for three years.

A partial examination of the blood was made in this case. From the skin puncture blood flowed very scantily, and was pale and watery in appearance. There was no tendency to continuation of the bleeding. Dr. A. W. Harrington kindly examined the films, and reports that they show evidence of a pretty marked secondary anæmia. Ring-staining is frequent and poikilocytosis well marked, with a tendency to the appearance of small corpuscles. No nucleated reds are present. Leucocytes are normal.

5. Antoni, son, aged 25, now in America, is also said to be subject to bleedings from the nose, but to be otherwise healthy, and free from the spots described. The latter statement, however, may not be correct, for the spots found on the other members of the family seem to have attracted little or no attention, and may have escaped notice in this case.

6. Jan, son, aged 22, a robust looking young man, perhaps a little pale in the lips, but not noticeably anæmic. He has two small red spots on the tip of the nose, and about a dozen, large and small, on the inner surface of the lower lip. All round the tip of the tongue are a number of small red elevated spots, having the appearance of unduly vascular papillæ. In his case no history of illness, epistaxis or other losses of blood could be discovered.

7. Gysbert, son, aged 18, a healthy youth. No spots found, but the condition of the tongue similar to that in Jan.

8. Francis, son, aged 13, also healthy and showing no spots, but the same condition of the tongue as in the two preceding cases.

None of the cases were especially liable to bleeding from cuts, and no accidental hemorrhage from the nævoid spots had been noticed.

No other relatives were known to have a similar affection.

In the above series of cases the mucous membranes of the throat and nose, the external auditory meatus and the skin of the body and limbs were not examined.

Hereditary Hemorrhagic Telangiectasia: A Clinical Picture.

Definition.—An hereditary affection manifesting itself in localized dilatations of capillaries and venules, forming distinct groups or telangiectases which occur especially upon the skin of the face, nasal and buccal mucous membranes and give rise to profuse hemorrhage either spontaneously or as the result of trauma.

Etiology.—Three factors seem of etiological import; namely, heredity, repeated traumatisms and the abuse of alcohol.

Of these three factors the hereditary tendency to the disease is by far the most striking and constant. With the single exception of hemophilia, there is no other disease which, so like a nemesis, pursues its victims through successive generations. There is in the literature no instance of a patient suffering with this affection and having children all of whom were free from the disease. Males and females are affected alike and both are equally capable of transmitting it to their offspring. To define with greater particularity this "hereditary tendency" would be a pleasure; to find the specific fault which underlies the disease is a problem of the future.

Repeated traumatisms certainly seem to play a part in the production of the telangiectases. The ears, the cheeks, the muco-cutaneous junction of the lips, the nasal and buccal mucous membranes, the finger tips—these are the sites of predilection and these are obviously the points most subject to frequent slight traumatisms. This, however, is only theoretical; a more specific instance has been detailed in the case of John F. R. (Case II). He had the misfortune to run a large splinter under a finger nail and the consequent suppuration caused the nail to come away. Eventually a new nail grew, and under it two large telangiectases were observed to have formed. These bleed so readily and profusely upon slight injury to the nail that the man's work has been seriously impeded.

The abuse of alcohol as an etiological factor is a personal impression gained from the study of my first family and only meagerly supported by the evidence of other writers. It is true that in most of the cases reported there is neither positive nor negative mention of alcoholic abuse. Osler's first three cases are exceptions. The first two were sailors, much given to those alcoholic habits so common in sailors; the third patient came from Kentucky. Theodore Raymond (Case III) has many more telangiectases than any other member of his family. He earns a fair wage and "drinks when he has the money." His uncle also had a profusion of facial telangiectases which he, with commendable candor, called "whiskey bumps." The vasodilator action of alcohol upon the peripheral capillaries may be mentioned with relevance in this connection.

Morbid Anatomy.—Upon inspection of the red spots characteristic of the disease it becomes obvious that they are true vascular formations and not blood extravasations. They blanch on pressure and regain their color when the pressure is removed. Those occurring upon the face are very prone to show the typical spider-nævus formation.

Figure 2 is an excellent reproduction of a microscopical section from a telangiectasis removed from the cheek of Theodore R. (Case III). The obliteration of the papillæ of the corium, together with the absence of the usual undulations of the stratum germinativum, is very striking. This is doubtless due to the relatively enormous dilatation of the blood vessels of the corium which are seen as wide spaces lined by a single layer of endothelium lying immediately subjacent to the greatly attenuated epidermis. These dilated vessels can be traced well down into the subcutaneous fatty tissue. A study of sections stained by various special methods failed to reveal any muscular or elastic tissue in the walls of the dilated superficial vessels, although the less dilated vessels in the subcutaneous fatty tissue show the normal arrangement of the tunicæ.

When one notes the very scanty protection afforded the dilated vessels by the thin epidermis it is no longer surprising that trivial traumatisms produce marked hemorrhage.

Subjective Symptoms.—Hemorrhage is the one constant

FIG. 1.

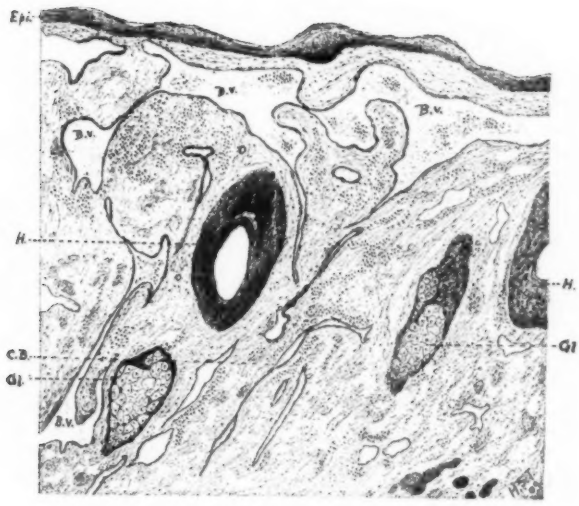

FIG. 2.

B. V. = Blood Vessels.
C. B. = Collapsed Blood Vessels.
Epi. = Epidermis.
H. = Sheath of Hair Root.
Gl. = Gland of Hair Follicle.

FIG. 3.

FIG. 4.

FIG. 5.

symptom of the disease and the source of all other symptoms. It takes in the great majority of cases the form of epistaxis, but this symptom may be entirely wanting. The hemorrhages always originate in telangiectases. Next to the nasal telangiectases those on the lips and buccal mucous membrane most frequently cause bleeding. The hemorrhages are astoundingly profuse; patients describe the blood as spurting from the injured spot. The nose may bleed freely several times each day, and while lay descriptions of hemorrhage are to be taken *cum grano salis*, personal observation upon several occasions has convinced me of the severity of the epistaxis. Secondary anæmia follows as a natural sequence of the frequent and profuse hemorrhages, and the concomitant symptoms of palpitation, breathlessness and swelling of the ankles become painfully evident. The hemorrhages produce anæmia, the anæmia conduces to hemorrhage, and thus a vicious cycle is inaugurated, each symptom playing the double rôle of cause and effect.

Objective Symptoms.—Multiple telangiectases constitute the sole characteristic sign of the affection. Their occurrence is most constant upon the nasal and buccal mucous membranes and the muco-cutaneous junction of the lips. They have been observed upon the skin of the face, hands and feet, upon the scalp, the conjunctivæ, and once post-mortem in the gastric mucous membrane. They begin as dilatations of the capillaries, having a bright red color. As they increase in size the venules participate in the ectasia, giving the cutaneous telangiectases a violaceous or purple color. The telangiectases of the mucous membranes are always brilliant red. The small telangiectases do not project beyond the surrounding structures, but as they increase in size they tend to become more elevated. They never attain to a great size; a split pea seems to represent approximately their maximum development. They are true developmental faults, beginning in early childhood, frequently causing increasing annoyance during adolescence and becoming serious menaces to health toward the evening of life.

Diagnosis.—There exists no reasonable diagnostic difficulty. The association of multiple telangiectases of the skin and mucous membranes with recurring hemorrhages from these telangiectases is highly characteristic. The disease has been referred to as a hemorrhagic diathesis—a term which not only covers all the symptoms, but conceals most of them. The more specific mistake of diagnosing the condition as hemophilia has been made repeatedly (Legg, Chiari, Chauffard, Coe). The error was in each instance one of interpretation rather than of observation. The diseases are so dissimilar that the presence of one renders the existence of the other highly improbable. Their coexistence is conceivable, but such a circumstance must be regarded as a fortuitous coincidence.

Treatment.—The therapeutic indications are clear. Destruction of the culpable telangiectases should be the first consideration. A bead of chromic acid fused upon a probe is an excellent cauterizer and its action can be checked at any time by the application of an alkali. Repeated cauterizations may be necessary, especially within the nose, for here the bleeding frequently takes place from very small telangiectases which are easily overlooked. The patient should be instructed to report for treatment, if possible, each time the nose bleeds, for it is only by the repeated destruction of small telangiectases that one can check the epistaxis and at the same time avoid widespread cicatrization of the mucous membranes. It is futile to treat the secondary anæmia so long as the hemorrhages continue. Remove the cause and the effect is readily amenable to treatment.

The disease is a definite clinical entity and as such deserves a specific name. I suggest that the affection be called *Hereditary Hemorrhagic Telangiectasia*, a name which I believe not only adequately describes the condition, but conforms to the strictest rules of medical nomenclature.

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THE PLACE OF PROTOZOOLOGY IN THE MEDICAL SCHOOL CURRICULUM.

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Every advance in scientific medicine means an increase in the amount of work required of the medical student. In the past few years the study of the protozoa has added many facts of more or less direct bearing upon medicine. Investigations into the etiology and the pathology of a number of diseases have made protozoan study a subject of ever increasing importance to the medical man. This increasing importance was first recognized, in a large way, by the appointment of the lamented Schaudinn to the directorship of the newly-created division of protozoology in the Imperial Bureau of Health of Germany, and later by the establishment of courses in protozoology in a number of medical colleges. I have no desire to submit any arguments as to the necessity of further increasing the work of the medical student by creating a new course, but wish rather to indicate some of the ground that such a course should cover in order to justify its creation. If the purpose of protozoology were merely to increase the student's knowledge of the etiology and the pathology of a number of diseases the establishment of a separate course would hardly be justifiable. The same ground could be covered by incorporating the matter into the work on bacteriology and pathology. When, three years ago, it became the duty of the writer to attempt to give to the students in the Medical Department of Western Reserve University some idea of protozoology it seemed that the course should include something more than a mere catalogue of protozoa which cause disease in the human being. It was felt that the purpose of the course should be a threefold one: to give a general survey of the biology of the protozoa, to train the individual student's powers of observation and to indicate the relationship of the unicellular animal organisms to disease.

In the Western Reserve Medical College bacteriology and pathological histology are taught during the second year, bacteriology running from the beginning of the year until the Christmas vacation, and pathological histology from the resumption of work after the vacation until the end of the year. Because of its close relationship to both of these subjects protozoology is also given during the second year. The only time available upon an already well-filled schedule was during the first month of the year, a time at which the study of bacteriology is begun but a time at which the student has not yet had any work in pathological histology. Not only is the period of forty hours at my disposal during this month too short a time for covering the ground, but it is impossible properly to discuss the relationship of protozoa to disease at a time when the student has no knowledge of pathology. A division of the work was, therefore, decided upon. The month alloted to protozoology is occupied with a study of protozoan biology and with attempts to train the student's powers of observation. The discussion of the etiological relationship of the organisms constitutes part of the course in pathological histology.

A few words as to the advisability of including in the course something more than the pathogenic relationships of the protozoa may not be out of place.

Protozoan Biology.

A review of general protozoan biology is of value to the student, not only because of the mental training that it may give, but also because many of the facts brought out by a study of the protozoa are applicable to other subjects with which the student must become familiar. Cellular pathology, in so far as it is really cellular pathology and not tissue or organ pathology, is at a standstill and can advance little further by the methods at present in use by pathological investigators. The great bulk of pathological histology of the present day occupies itself chiefly with descriptions of variations in the results of pathological processes and with a cataloging of the variations in the finer architecture of tumors. That portion of the literature which does deal with abnormal individual cells concerns itself only with the morphology of such cells and makes little or no attempt to correlate the differences in morphology with altered function or with alterations of the normal biological relationships of the cells. Many of the facts which have resulted from the work of recent years upon protozoa will prove to be of direct value when applied to pathology. The work of Maupas, R. Hertwig, Calkins and many others upon the conditions of depression and senility in protozoa and upon the means by which protozoa may recover from such conditions; Hertwig's theories concerning the relationship existing between nucleus and cytoplasm and the results of disturbances of this nucleus-plasma relationship; the establishment of the bearing of extranuclear chromatin upon the physiology and the reproduction of the cell; Schaudinn's views concerning the dual nature of the nucleus; all of these are ideas rich in promise when applied to a number of problems in general pathology. Autochthonous pigmentation, degeneration and necrosis, hypertrophy and hyperplasia, and tumor formation offer fields for the application of the general biological principles enumerated.

Normal physiology deals chiefly with tissues and organs. A large part of physiological investigation, with the notable exception of the kind carried on by Rhumbler, Verworn, Jennings and a few others, still has far to travel before it begins to realize that the cell theory had its beginning in 1838, and that, ultimately, the explanation of normal physiological processes must be dependent upon a knowledge of normal cellular activity. Verworn has made a most earnest plea for the development of a real cellular physiology, based upon the study of the protozoa. Certainly many of the problems connected with the reactions of living matter to stimuli, with cellular metabolism, with reproduction, and with secretion and excretion

may hope for partial elucidation from experimentation upon protozoa.

If cellular pathology and physiology are to advance the progress must be, to a large extent, along the lines of investigation indicated. In order that the well-trained physician of the future may have the sort of training which will permit him to appreciate the additions that will certainly be made to pathological and physiological knowledge he should have at least a superficial insight into so much of protozoan biology as may become applicable to the problems in these fields.

Not only is the biology of the protozoa of importance because it may help in the elucidation of certain pathological and physiological problems, but also because a broad knowledge of many of the diseases caused by protozoa is dependent upon the ability to realize the close relationship existing between the biology of the pathogenic protozoa and the clinical and pathological manifestations produced by them. It is essential for the physician to know that a diagnosis of malaria is justifiable if, in addition to certain clinical symptoms, the red blood corpuscles show certain characteristic changes. It is likewise essential that a child of the most ordinary mental attainments should know that $2 + 2 = 4$. In either case the mind is in possession of certain facts which need not necessarily indicate a very high degree of intellectual development. When the child learns that $2 + 2 = 4$, not because of any magic properties inherent in the symbol, 2, but because each portion of the left-hand side of the equation can be further simplified into $1 + 1 = 2$, mental qualities of a comparatively high order have been developed. The development is comparable to that possessed by the medical student who realizes the very intimate relationship existing between the biology of the malaria parasite and the symptomatology, the pathology, the treatment and the prophylaxis of the disease. The student who is able to correlate the paroxysm of malaria with the sporulation of the parasite, the anemia and the changes in the internal organs with the destruction of the red corpuscles, the relapse with the parthenogenesis of the makrogametocyte, the cure of the disease with the effect of quinin upon the parasite, and the mosquito with the sexual cycle of the parasite, will be in possession of facts which he has obtained by reasoning from cause to effect. The value of his knowledge is directly proportional to the development of his reasoning powers.

The Training of the Powers of Observation.

In the experience of the writer a large proportion of students have great difficulty with pathological histology. Theoretically, the student who has had a course in normal histology ought to be able to recognize the morphological characteristics of the various kinds of tissue cells. When, however, he attempts to apply this knowledge in the study of a simple inflammatory lesion, for instance, he is apt to lose himself. He seems to think that a pus cell, because of its presence in an inflammatory exudate, is a pus cell and not a leukocyte. The fibroblast, because of its occurrence in a pathological process, is a new type of cell—in the mind of the student it seems to have no relationship whatever with a young connective tissue cell. The trouble is apparently due to an inability to reason or to co-ordinate facts already in his possession. Many factors may be concerned in this lack of power properly to associate ideas. One of the most important appears to be the nature of the undergraduate training. Memory is developed at the expense of reason, and the most brilliant Bachelor of Arts is apt to be the student with the most retentive memory. If he continues to depend almost entirely upon memory he becomes a very mediocre student of a subject like pathological histology.

The study of free-living protozoa ought to be helpful in overcoming this tendency toward relying upon memory alone. The student can readily see the differences in the type of locomotion possessed by a ciliate, a flagellate and an ameba. If, then, he is able to say that a given organism, which he has never seen before, is probably a ciliate because of its type of motility he has called into play something more than a retina and a memory. The study of living organisms is considerably more difficult than the study of a stained section of an abscess, but it is this very difficulty which helps to train the powers of observation. The mere necessity of moving the slide in order to follow a swimming protozoon may be helpful in establishing a condition of mental alertness.

The Pathogenic Action of the Protozoa.

The study of the reactions of the tissues to protozoan infection is the simplest portion of protozoology. Given a knowledge of protozoan biology sufficient for an understanding of the ways in which protozoa may act upon the tissues, and observational powers sufficiently well trained to recognize the resulting changes when seen—and the student ought have no difficulty with the pathology of protozoan infections.

Outline of the Course.

That portion of the course which deals with the organisms themselves and with their life manifestations, rather than with their relationship to disease, is arranged according to the outline which follows.

The work begins with a study of such free-living, freshwater protozoa as can be readily obtained. The number of species studied varies, of course, from year to year, because the protozoan fauna of the ponds which furnish the material may show some variations. Whatever the species used, the range is always sufficiently wide to illustrate the more important characteristics of the rhizopoda, the flagellata, the ciliata and the suctoria. This part of the work is not undertaken from the standpoint of systematic zoology, but with the view of developing the powers of observation and in order to illustrate, upon living material, the variations in morphology produced by specialization and differentiation. The structure of protoplasm, the differentiation of the cytoplasm into ectoplasm and endoplasm and the complex variations which specialization has produced in the external organelles are studied. The student is constantly reminded of the fact that the protozoa are not only single cells, but also individuals, and as such are

subject to the same conditions and the same laws which govern metazoan individuals. All of our students have had undergraduate courses in biology. As an aid to that portion of protozoan biology which, for the reasons given earlier, is held to be necessary this undergraduate work is a negligible quantity. The number of species is usually so small as to give a totally inadequate idea of the protean characters of the protozoa. Furthermore, these courses are usually so arranged that the majority of the students carry away with them only the idea that the protozoa are animals, and as such are to be grouped with the other animals studied in the course. They do not seem to get hold of the two fundamental ideas that the protozoa are single cells and that they are individuals. I do not wish the above remarks to be construed into an argument against the value of such instruction in biology as the student receives during his undergraduate course. But I do feel that the average course in biology does not sufficiently emphasize the special details which the ever-increasing importance of protozoology demands. Protozoology, if it is to be included in the medical curriculum as a separate course, should be considered in such a way as to make it a subject distinct from comparative zoology, but its actual present relationships and its possible future relationships to bacteriology, pathology and physiology should always be kept in mind.

The study of the resting protozoan nucleus follows the work dealing with the external characteristics of the organisms. Variations in nuclear morphology, while interesting, are not so important as the diverse relationships which the several nuclear constituents may show to each other and to the morphological nucleus. Certain conceptions concerning nuclear substances, conceptions with which his previous work has not at all familiarized the student, receive particular attention because of their importance to cellular physiology and pathology. Of these may be mentioned the distribution of the chromatin without the formation of a definite nucleus, illustrated by certain stages in the cycle of the malaria parasite; the presence of vegetative extranuclear chromatin, as occurs in Actinosphærium; and reproductive extranuclear chromatin, as in Arcella.

The division of the protozoan nucleus also deserves attention because of the variations exhibited by protozoan karyokinesis, because of the help that a knowledge of these variations may give in understanding the mitosis of metazoan cells and because this portion of the subject leads naturally to the most important chapter in protozoan biology, that dealing with sexual processes and with life cycles. For the study of nuclei stained preparations are necessary and, in so far as is possible, use is made of stained examples of organisms which were studied earlier in the living condition. In the work on morphology and on the nucleus the constant aim is to compare protozoan characteristics with the most nearly related ones of those metazoan cells with which the student ought already be familiar.

Conjugation, copulation, the sexual differentiation which may be associated with these two processes, and the sequence of morphological and nuclear changes which constitute the life cycle form the most difficult chapter in protozoology. Difficult, because of the widespread application of the facts concerned and because these facts must be presented largely in a didactic manner. Great as is the difficulty connected with this chapter its importance is even greater, a point to which Calkins has called attention. It is not to be supposed that every second-year student will develop ultimately into an investigator of pathological problems, nor should it be the aim of a medical school course to attempt to produce finished protozoologists. But even an elementary knowledge of protozoan biology, particularly of that portion dealing with the nuclear variations of different species and of a single species during the various stages of its life history, would have prevented the discovery of many of the pseudo-protozoa which are met with all too frequently in pathological literature.

The first portion of the course ends with a discussion of the correlation of protozoan biology and parasitism. The results of parasitism are considered from two standpoints, that of the parasite and that of the host. It is of value to understand what changes parasitism has produced in the morphology and the life histories of protozoa, the parasitic forms being compared with the most nearly related free-living ones. The effect of parasitism can be considered at this time in a superficial manner only, because the student does not yet have any knowledge of the fundamental principles of general pathology.

The work in protozoan biology is given in three hour periods, the first hour being devoted to didactic and the final two hours to laboratory work. As already stated, living forms are used whenever possible. When these are not available for the illustration of any particular portion of the subject stained preparations are used. As many of the parasitic and pathogenic forms as can be obtained are included. The student is required to make drawings and detailed written descriptions throughout the work.

The relationship of the protozoa to disease constitutes part of the work in pathological histology. In the latter course, as at present given in the Western Reserve Medical School, the general subject of inflammation is followed by a group of conditions included under the heading, "Special Infections." In this subdivision a number of bacterial infections, pneumonia, typhoid fever and others, are considered as disease entities. Typhoid fever, for instance, is studied not as an intestinal inflammation but as an infection which leads to reactions on the part of organs other than the intestine. In the consideration of diseases due to protozoa special attention is paid to so much of the biology of the parasite as is helpful in explaining the reaction produced by the parasite. In the "Special Infections" group are included the amebic infections, trypanosomiasis, the spirochætoses (exclusive of lues), coccidiosis, malaria and the intestinal parasites. The group includes also certain conditions of probable protozoan etiology, rabies, variola and vaccinia; and diseases of possible protozoan origin or diseases in which protozoa or pseudo-protozoa have been described, as the acute exanthemata, leukemia and Hodgkin's disease. Syphilis is discussed as a protozoan infection under the infectious granulomata.

The outline above is not submitted with the idea that the course is a perfect or an ideal one. But bearing in mind the premise stated at the beginning, that protozoology to justify its establishment as a separate course ought to include a certain amount of general biology; and bearing in mind also the time and the material available, as well as the educational acquirements and deficiencies of the students, the work outlined seems to cover the ground desired. Any further development of our knowledge of the protozoa ought, perhaps, be equally divided between the biology and the pathology of the subject. The ideal course would be one in which protozoology is only a part of medical zoology, a course which should include the biological and pathogenic relationships, not only of the protozoa, but also of the parasitic metazoa.

A CASE OF GENERAL INFECTION WITH *BACILLUS MUCOSUS CAPSULATUS* FOLLOWED BY AN AREOLAR ABSCESS OF THE LIVER AND GENERAL PERITONITIS. AUTOPSY.

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Primary idiopathic abscess of the liver, except in cases of direct or indirect traumatism, may be said very seldom to occur. In direct traumatism a penetrating dagger, a splinter of wood, a bullet or the like, may carry in with it infecting organisms and suppuration may follow. In indirect traumatism, as by a blow or fall on the hepatic region, the liver may receive severe injury, some of its blood vessels may be ruptured, hæmorrhage may take place into the parenchyma, and the resistance of the organ be greatly lowered. It may form as a result of such injury a fertile soil for the growth and multiplication of organisms, which would otherwise not be attracted to it, or whose virulence normal liver tissue could readily withstand. In all other cases of hepatic abscess we must, ordinarily, consider the condition secondary to a focus in some other region of the body. The source of infection may be at times comparatively small, insignificant, and easily overlooked. Josserand (1) has reported a case of amœbic abscess of the liver occuring ten years after an attack of dysentery. In such a case the infectious focus must be of the nature of a chronic inflammation. The amœba must have been lurking and living in some portion of the body and there producing a certain amount of irritation, though not enough, perhaps, to produce any manfestly discernible symptoms. However, there are cases on record (2) of undoubted abscess of the liver, in which amœbæ were found in the abscess, but no history of preceding dysentery could be obtained, and in which post-mortem examination showed a normal gastro-intestinal tract. There is, also, recognized by some authors (3) a group of cases of infective suppurative hepatitis with abscess formation in which the utmost care has failed to reveal, either during life or after death, any primary point of infection.

The clinical history of our case is as follows, and seems to belong to the above described third group:

A. J., white, American, æt. 23, married, book-keeper, entered hospital April 30, 1908.

Complaint.—Fever and abdominal pain.

Family History.—Unimportant.

Personal History.—Unimportant.

Present Illness.—Patient has not felt like work for the past ten days. Four days before admission to the hospital he was seized with fever, which has persisted without remission. The next night he had irregular fleeting pains in the upper right chest and a dull constant pain in the upper right abdomen and back. He also had headache and a feeling of chilliness. He vomited frequently that night, but has not vomited since. On the day before admission he had a severe chill. He has never been jaundiced.

Physical Examination.—On admission, temperature, 103.4° F.; pulse, 92; respirations, 22 to the minute.

Patient is fairly well developed and rather poorly nourished. Face is flushed. Herpes on lips. Tongue is dry and coated with a white fur. The superficial lymph glands are not enlarged.

Thorax.—Normal.

Abdomen.—Liver extends from the 4th rib above to 2.5 cm. below the costal margin. Its edges are not palpable. Palpation is very painful over the right lobe of the liver, but less so over the left lobe. Deep palpation is slightly painful in the right iliac region. Abdomen is not distended. Spleen apparently enlarged, palpable just below the costal border.

May 2.—Epigastric pain, which has been very severe, has now markedly decreased. His abdomen is quite distended, especially below the umbilicus.

Operation.—Exploratory laparotomy and drainage by Dr. D. P. Allen.

On opening the abdomen the liver seemed somewhat enlarged. The hepatic flexure of the colon was drawn up and found covered with fibrino-purulent exudate. The cœcum and appendix were exposed; the latter was free and not enlarged; its peritoneal surface was dull and partially covered with seropurulent material. The pelvis was explored and found full of thick yellowish pus. The peritoneal coat of the small intestine was found injected and quite dull in appearance. No perforation could be found. Owing to the patient's poor condition it was thought unwise to attempt further to discover the source of the pus.

May 3.—On the day following the operation, May 3, the patient looked brighter and his general condition had improved. Late in the afternoon of May 4, his temperature began to rise and he became restless. During the following night his pulse became weak and rapid; by morning it was weaker and more rapid; he was at times delirious, and died at 8.15 p. m.

Urine.—At no time, either before or after operation, did the urine show anything of importance.

On May 4, the day before the patient died, a blood culture taken, under aseptic precautions, from the median basilic vein of the right arm gave the *B. mucosus capsulatus* in pure culture. Its appearance and general characteristics, as well as its cultural growth, were identical with the organism obtained at autopsy and described in the bacteriological report of this paper.

Autopsy, 938.

May 6.—13 hours after death.

Anatomical Diagnosis.—Acute, general, diffuse, fibrino-purulent peritonitis; areolar abscess of liver; general infection with B. mucosus capsulatus; parenchymatous degeneration of the heart muscle, liver, kidney, adrenal and pancreas; acute lymphadenitis; acute splenic tumor; œdema and congestion of lungs.

Abdominal Cavity.—The abdominal wall is quite thin; the subcutaneous fat scanty. The serous surface of the abdominal wall and viscera is everywhere covered with a layer of thick greyish-white purulent material of very foul odor. Beneath this exudate the surface is deeply injected and dulled. The inner surface of the abdominal wound is quite ragged, its margins ulcerated and covered with fibrino-purulent exudate. The omentum is massed on itself and drawn over to the left hypochondriac region. It is matted together by fibrino-purulent adhesions and its surfaces, with the serous surfaces in general, are covered with fibrino-purulent exudate. All the abdominal fossæ and dependent portions of the cavity are filled with soft creamy pus. The appendix is free, short, straight and firm. Its tip lies over the brim of the pelvis in a pool of pus.

The liver reaches 10 cm. below the costal margin. The surfaces of both lobes are covered with fibrino-purulent exudate. This may be stripped off in sheets from the upper surface. The surface is deeply congested and red. On passing the hand upwards between the diaphragm and the liver, the liver substance readily yields to pressure and there is distinct fluctuation. The gall-bladder, filled with bile, appears normal.

The spleen is enlarged and soft. It is adherent to the diaphragm, fundus of the stomach, and abdominal wall by delicate fibrino-purulent adhesions.

Examination of the whole alimentary tract, from the œsophageal opening of the stomach to the anus, shows no perforation.

Liver.—It weighs 2000 gr. It measures 25 x 22 x 9 cm. Its peritoneal surface is everywhere covered with a membrane-like layer of fibrino-purulent exudate. Beneath this membrane, which may be readily stripped off in sheets, the liver surface of the left lobe appears of a fairly uniform light greyish-yellow color. The surface of the right lobe shows marked mottling, especially over its posterior portion. Over this region of the right lobe the surface is of a general dark red color, dotted at several points with irregularly quadrilateral and round, opaque, soft areas, varying from 1-2 cm. in diameter. Over these opaque areas the surface is roughened and in some places broken. Where they are broken they are seen to open into subjacent abscess cavities. The anterior portion of the right lobe is fairly soft and friable; the posterior portion, quite soft and fluctuating. On pressure, greyish-white, foul-smelling, purulent material may be pressed out through the openings on its surface. Beginning at a point on the outer border, 5 cm. from its anterior extremity, there is an irregularly triangular area, measuring 10 x 8 cm., throughout which the liver surface is deeply injected and of a dark red color. At its base it merges into the abscess area in the posterior portion of the lobe. On section the cut surface of the anterior portion of the right lobe and the whole of the left lobe have, practically, the same appearance. It is of a pinkish-yellow color, soft and friable. The lobules are readily made out and the central veins are visible as small, injected, red points. The central veins are surrounded by an ill-defined ring of light yellowish-grey tissue, slightly translucent. Outside of this the tissue of the portal spaces is darker and more opaque. Section through the triangular area described above, shows a cut surface of deep red color and slightly mottled. The tissue is of a softer consistency than that in the anterior portion of the lobe. The lobules are very indistinct and ill-defined. The blood vessels are distended and filled with greyish-red, fairly firm thrombi. Scattered over this area, increasing in number as we proceed posteriorly and towards the outer border, there are numerous greyish-white points, varying in size from a pin point to 1 cm. in diameter, and from which on pressure soft tenaceous opaque material may be expressed. These points can be readily seen to be situated in the hepatic veins.

The Abscess.—A section through the posterior portion of the right lobe shows an irregular eliptoid area, measuring 10 x 9 x 7 cm., with a fairly well defined border separating it from the surrounding deeply congested liver tissue. Over this area the tissue is seen to be made up of a network of intercommunicating sinuses and alveolar spaces, filled with greyish-white, foul-smelling, tenacious and viscid purulent material. The intervening septa of liver substance have a slightly tortuous radial arrangement. The veins contain deep red and reddish-white thrombi. On opening the inferior vena cava a thrombus is found projecting for a distance of 1 mm. from the main hepatic vein. On pressure purulent material may be expressed from the hepatic veins into the lumen of the inferior vena cava.

The portal vein, when examined throughout its course and as far into the liver substance as its branches can be readily followed, is everywhere free and shows no thrombi, emboli or evidence of pylephlebitis.

Microscopical Examination.

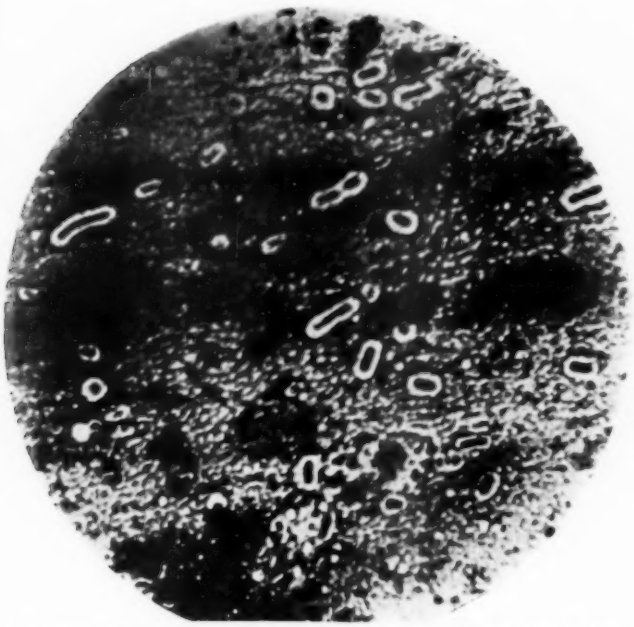
Liver.—Examination of the abscess-area shows the abscesses to have a fairly uniform structure. Proceeding from the center of one of the abscesses towards the periphery, we meet, first, a vacuolated, pink-staining area of necrotic structureless material; outside of this area there is a darker zone of densely packed and deeply staining leucocytes, small round cells, broken liver cells and granular material; along the outer border of this zone there is an irregular line of bacilli; outside of this line we have the degenerated cells of the liver parenchyma and of the septa that run between the abscesses. These septa vary in width. Scattered through them are numerous areas of small hæmorrhages. The bile ducts are well preserved and are undergoing active hyperplasia. Beneath Glisson's capsule there is a zone of round cell and leucocytic infiltration. The blood vessels are dilated and distended with blood.

Sections from the anterior portion of the right lobe, just anterior to the abscess-area, shows numerous small and large solitary abscesses, which appear as local areas of suppurative phlebitis, always associated with a hepatic vein. The lumen of the vein is filled with polymorphonuclear leucocytes, small round cells, broken endothelial cells and granular material. Bordering on and in the wall of the vessel are numerous bacilli, often aggregated in clusters. In the large areas the wall of the vein has been almost destroyed and exists only as a ring of degenerated connective tissue cells; in the smaller areas it is fairly well preserved. Outside of the vessel wall there is a band of broken liver cells and marked leucocytic and small round cell infiltration. In the very smallest abscesses the suppuration is limited almost entirely to the lumen of the vessel.

In the remaining portion of the right lobe and throughout the left lobe there is only acute congestion of the blood vessels and parenchymatous degeneration of the liver cells. The connective tissue about the portal spaces is slightly increased and there is round cell infiltration. There is nowhere any evidence of an acute cholangitis, either in the small or large bile ducts.

Bacteriological Report.

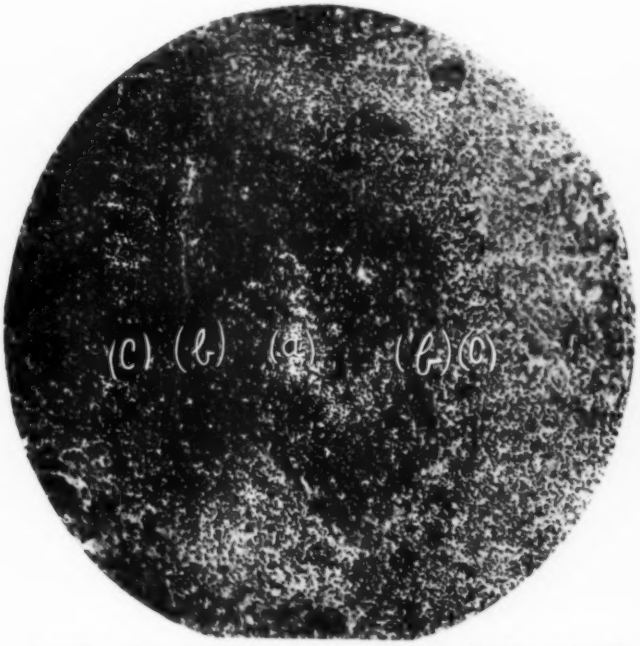
Smears were made from the fibrino-purulent peritoneal exudate and from the purulent material obtained from the large liver abscess. The bacteriological picture is identical in both preparations. With the gentian violet stain there is seen a large plump bacillus, varying in length from 3-8 μ, with rounded ends and a distinct halo about each organism. With Welch's capsule stain distinct capsules can be made out about each organism. No other organisms could be seen. No amœbæ or other protozoan organ-



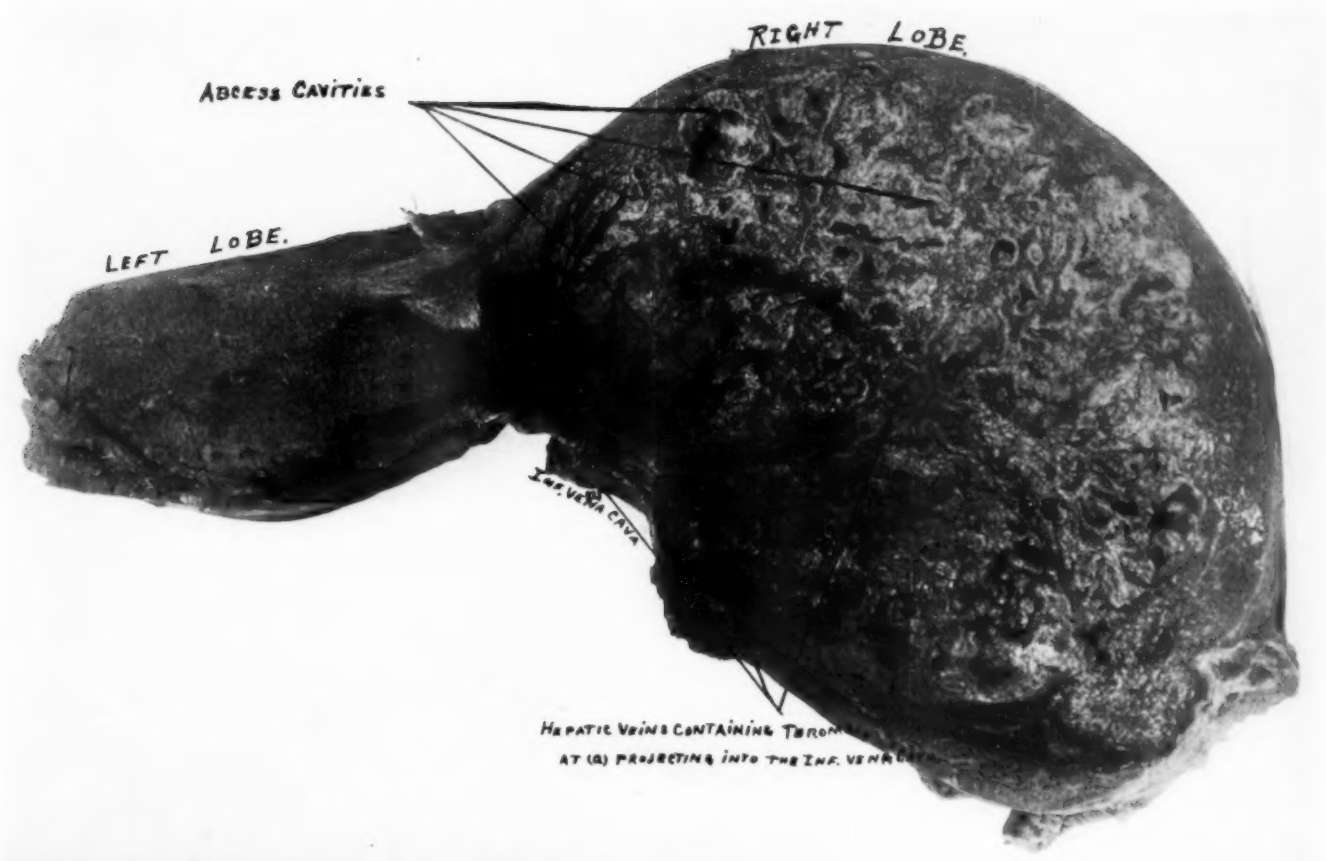
A smear from one of the liver abscess cavities, stained with Welch's capsule stain. A smear from the peritoneal exudate, stained in the same manner, shows a similar picture. × 1000.

One of the smallest vessels, showing the lumen of the hepatic vein filled with purulent material and the leucocytic infiltration almost entirely limited to the vessel wall. × 100.

A portal space, showing nothing abnormal, save a slight round cell infiltration and slight increase in the connective tissue. × 100.



A section of one of the smaller abscesses situated just anterior to the large areolar abscess showing (a) the lumen of a hepatic vein filled with purulent material, (b) the ill-defined vessel wall, and (c) the marked leucocytic infiltration around the margin of the vessel. × 100.



The appearance of a cross-section of the liver, made about 10 cm. anterior to the posterior extremity. × 1.

isms were found in the liver abscesses. The organism found decolorized with Gram's stain.

Cultures made on plain agar from the heart's blood, liver, spleen, lung and kidney were positive in all save those from the spleen. The cultures in all were pure and their growths identical.

The organism obtained from the cultures is about .5 μ in width, has rounded ends and varies from 3-5 μ in length. It decolorizes with Gram's stain, has no spores, and is non-motile. After 24 hours incubation at 37° C., its cultural growth are as follows:

Plain Agar.—There is an elevated white lustrous growth with wavy margins. When touched with a platinum needle it is seen to be very tenaceous and mucus-like. Subsequent growth showed no marked change.

Glucose Agar.—Stab cultures showed marked gas formation, portions of the media are raised 1 cm. above adjacent portions.

Litmus Milk.—There is coagulation and acidification. Cover slip preparations stained with Welch's capsule stain showed distinct capsules. Subsequent growth showed no peptonization.

Plain Bouillon.—There is a diffuse turbidity and slight greyish-white sediment. Subsequently the turbidity greatly increased and a distinct pellicle formed.

Potato.—There is a rather diffuse greyish-white growth, quite moist and viscid, with marked gas formation in the water of condensation along the side of the tube.

Dunham's Bouillon.—There is a growth similar to that noted in the plain bouillon. After 12 days there is a fairly marked indol reaction with 10 per cent sulphuric acid and 1 per cent sodium nitrite.

Gelatin.—After 3 days growth at room temperature (about 20° C.), there is a distinct growth along the stab and an accumulated growth on the surface, giving a nail-head appearance. There is no gas formation or liquefaction. Subsequent growth showed no change.

Blood-serum.—There is a lustrous white growth along the line of stroke. It is very tenacious and stringy when touched with a platinum needle. Its margins are wavy.

Animal Inoculation.—1 cc. of an emulsion, made from a 24-hour growth on slant agar with sterile bouillon, injected subcutaneously over the abdomen, produced death in a guinea pig in 27 hours. At autopsy the organs were found generally congested and moist; the lungs, œdematous. Cultures made on slant agar from the heart's blood, lung, liver, spleen and kidney, in each tube, gave a pure culture of an organism, in all particulars, similar to the one described above.

Anærobic cultures, grown in air-tight jars deoxygenated with pyrogalic acid and sodium hydroxide, showed a growth quite similar to that obtained ærobically, save that it grew much slower and not so luxuriantly.

The fermentative power of this organism was tested in no other media than glucose agar. The activity of the fermentation there noted and the fact that it acidified and coagulated litmus milk, make it most probably belong to the "ærogenes" group of the capsulated bacilli, as described by Strong (4). Moreover, Perkins (10) has shown that all of the ærobic capsulated bacilli that have the power to break up sugars with gas formation may, by change of environment or passing through animals, be reverted to the "ærogenes" group as the prototype; that these organisms may, also, lose their fermentative power, in whole or in part, through modifications in environment.[1]

The clinical history, autopsy, and bacteriological findings in this case are extremely interesting in as much as a case of general infection and gas-cyst formation in man (5), an epizootic infection of the laboratory guinea pigs (6), both due to the *B. mucosus capsulatus*, and a study of the group of capsulated bacilli, in which organisms of the bacillus mucosus type were noted 56 times in 74 consecutive autopsies (11), have already been reported from this laboratory, and we are, still, repeatedly meeting with this organism as a primary and secondary invader in various kinds of lesions and conditions found at autopsies.

In the case here reported we apparently had first a general bacteriæmia and septicæmia, due to the *B. mucosus capsulatus;* subsequently, there was the formation of numerous minute abscesses in the liver. These minute abscesses increased in size till portions of their peripheries became coalescent, and thus formed the large multilocular, areolar abscess; this extended to the peritoneal surface of the liver, from which the infection spread to the general peritoneal cavity.

One of the series of cases of general septicæmia reported by Duval and Lewis (7) is important in this connection. A male patient, 37 years of age, born in Holland, and a cigarmaker by occupation, came into the hospital complaining of general malaise, loss of strength, and fever. He remained in the hospital 5 weeks, recovered completely, and returned to work well and strong. On the day after admission a blood culture was taken, under aseptic precautions, and plates yielded a pure culture of *B. capsulatus*. There were from 50 to 200 colonies per plate. One week after admission a second blood culture was taken. The cultures again were pure and showed the same organism. The number of colonies to the plate was larger than that obtained from the first cultures. A third blood culture was taken on the day of discharge. Again the cultures were pure and the number larger than that noted at any time before, equal and the same quantities of blood having been plated at each time. They note the apparent rarity of this organism as an agent of general infection and believe that the conclusions of this case have important bearings on immunity problems.

At the time the patient was discharged there were more bacteria circulating in his blood than when admitted to the hospital, as shown by bacteriological cultures; still he was to himself and others well and able to do work. Two weeks after his discharge the patient was seen at work and feeling perfectly well. These facts, they argue, indicate that, in addition to the acquired immunity to soluble toxins and the acquired bactericidal immunity, the human body has other mechanisms of protection against bacterial infection. The tissues in this case, they think, seems to have acquired a resistance to the toxic products of the infecting organism without there being developed substances harmful to the bacterial cell, the resulting condition becoming possible by the survival of the host and being a causal one between the animal body and the bacterium.

Perhaps this explanation, in a measure, offers a solution of the conditions of our case. Here the liver may be considered to have lost this power of resistance to the infecting organism and consequently suppuration and abscess formation has resulted.

[1] Only that portion of the autopsy and microscopical findings have been described here which bear directly on the case.

Why the liver or any organ should lose this power of resistance and become the focus of infection and the other organs remain free, while infectious organisms are continually circulating through them, has been a recognized but unsolved problem for years.

As to why the abscesses should, in the present case, be exclusively connected with the hepatic veins is also quite difficult to answer. There would appear to be no reason for or evidence of retrograde embolism. There were no thrombi in the heart or thoracic vessels; special care was taken to look for them.

This type of abscess is also rather interesting. It was first described by Charcot under the name "abscès aréolaire" (8) in connection with suppurative cholangitis and by Chauffard (9) in connection with suppuration in the portal system. It has also been described in connection with suppurative phlebitis of the hepatic veins. It is characterized by its infarct-like form and spongy structure. It may be formed by the fusion of numerous points of suppuration about the radicles of the portal or hepatic vein, or the branches of the hepatic bile ducts. A pyogenic membrane may form around its periphery and ultimately a well defined capsule may develop. It is said to be most commonly associated with infections of the appendix.

In conclusion we may safely say from the evidence here given, that—

1. *B. mucosus capulatus* may form multiple abscesses in the liver. These may be of the areolar type and result from a general infection with this organism, where the mode of infection and the point of inoculation is not apparent.

2. These abscesses may be all associated with the central hepatic veins of the liver lobule, for some reason and by some process that we are not able to determine.

I am greatly indebted to Dr. W. T. Howard for aid and assistance in the preparation of this report and also to Dr. David Marine, of the Western Reserve Medical School, for the accompanying microphotographs.

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THE INFLUENCE OF SEWERS AND GENERAL SANITATION UPON THE PREVALENCE OF TUBERCULOSIS.

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If it should appear to you from the title of my paper, that I am one of those who believe in the ubiquity of the tubercle bacillus and that the question of predisposition should receive first and foremost consideration, I desire it to be understood, that I am convinced from the splendid labors of Professor Carl Flügge and his associates, that the tubercle bacillus is not ubiquitous and hence the task of stamping out the primary sources of infection is by no means a hopeless one.

I believe, however, until this is accomplished that in this disease, as in other infectious diseases, due attention should be given to all the causes likely to influence their spread. In the course of my remarks I will have occasion to refer, therefore, to some of the more obscure factors concerned in the prevalence of tuberculosis, not because I consider them of paramount importance, but simply with a view of pointing out their relative influence, so that in our efforts to combat tuberculosis, they may receive proper consideration.

Sources of Infection.

The tubercle bacillus has been found in all tubercular deposits in man and animals, and the most frequent source of infection is conveyance from man to man, while the possibility of transmission from animals to man cannot be ignored.

The germs may enter the system by the respiratory and alimentary passages and by the skin and mucous membranes, if there is an abrasion. The tubercle bacilli have not yet been demonstrated in the soil, water or in the atmosphere, except in the immediate vicinity of a consumptive. Since the expired air of tuberculous patients does not contain the germs, we may assume that, when found in rooms, they originate largely from the material coughed up by persons and carelessly expectorated upon the floor, walls or carpets, which material after drying becomes a constituent of the household dust. Cornet demonstrated their presence in the dust of rooms and hospitals occupied by consumptives in 40 of the 147 samples examined. The investigations of Heymann, conducted under Professor Flügge, show that about 8 per cent of the dry dust collected in 120 private dwellings and wards occupied by consumptives contained tubercle bacilli. When collected with moist sponges, 15 per cent of the dust obtained from private rooms and 40 per cent of that collected in wards gave positive results by inoculation of guinea pigs. Wagner secured positive results in 8 per cent of his inoculations with dust collected in one of the German sanatoria.

In view of these facts, Professor Flügge believes that the danger from inhalation of infected dust has been overrated. Personally, I regret this statement, because the remarkable fact after all is, not that the tubercle bacilli were present in such a small percentage of the specimens examined, but that they should have been found at all, had proper precautions been taken in the collection and disposal of the sputa.

It has also been shown by the classical investigations con-

ducted under Professor Flügge, that about 80 per cent of consumptives may in coughing and talking project into the air little droplets infected with the bacilli, within a distance of 2 to 3 feet from the patient; and that these droplets constitute a very important source of danger, as they may be inhaled in a fresh and virulent state by persons in close proximity, especially if patients fail to guard against this mode of spreading, by the use of handkerchiefs held before their mouths. Flügge, without wishing to exaggerate the danger from droplet infection, believes it to be greater than from the inhalation of infected dust. He also emphasizes the sources of infection from fresh sputum on floors, causing contact infection, especially in children, and points out the dangers from infected handkerchiefs, clothing, towels, etc. It is perfectly conceivable that the germs may likewise be conveyed by small particles of sputum in kissing, in instrumental manipulations, or by adhering to eating and drinking utensils in common use. There is much reason to believe that the germs may be conveyed in clothing from carelessly expectorated sputum. Perlen tells us that of 4177 tuberculous subjects, treated in the Munich Poliklinik, 709 were engaged in tailoring, cleaning and shoe shops.

Tubercle bacilli have been found in the milk of tuberculous mothers and cows, especially when the lacteal glands were the seat of the disease or the system infected with general tuberculosis. Milk, cream, butter, ice cream and dairy products may contain tubercle bacilli if the product is derived from an infected cow.

The possibility that the germs of tuberculosis may be carried by means of flies and dust suggests that greater precaution be exercised in the exposure of food stuffs in show windows and markets.

As in other infectious diseases, the question as to whether the germs are introduced directly, and in sufficient numbers, is of importance. The observations of Humphrey, Pollock and Leudet conclusively show that in well-ventilated wards, of chest and consumption hospitals, the disease is not usually found to spread. In private practice the results are different. A French committee of investigation presents two hundred and thirteen cases of tuberculosis in which the communicability of the disease was clearly established. In sixty-four of these cases the disease was conveyed from husband to wife; in forty-three from the wife to the husband; in thirty-eight it was transmitted to brothers or sisters; in nineteen from parents to the children; in sixteen to distant relatives; and in thirty-two to outsiders. The communicability was most marked among the poorer classes. Another collective investigation by a German medical society revealed the fact that of nine hundred and thirty-eight married persons who died of acquired tuberculosis, in one hundred and one instances either the husband or the wife also contracted the disease. In 8.1 per cent of these cases the husband contracted the disease from his wife, and in 13.2 per cent the wife was infected by the husband. Other statistics might be adduced in favor of the communicability of the disease, but Zasetzky's observation is of special interest. He reports the case of a tuberculous woman who married, between 1872 and 1883, three husbands, all previously healthy; the first husband died in 1879 of tuberculosis, the second in 1881, and the third husband, at the time of the report in 1884, was also a victim of the disease, the wife in the meantime having died of consumption.

We can only explain the greater contagiousness in such instances by a more intimate contact, the occupation of the same room and bed, common use of eating and drinking utensils, mouth to mouth contact, the vitiated air of private rooms and greater danger from droplet infection. There is little or no evidence to show that the disease is ever inherited, but we may assume that in children of consumptive parents we are dealing with the transmission of vulnerable anatomical elements, and this, together with the fact that they are constantly exposed to the germs, renders them peculiarly liable to the disease.

Predisposing Causes.

From what has been said it is evident that while the tubercle bacilli are not ubiquitous they are at least widely scattered; the modes of invasion are also numerous, and yet there are a certain proportion of those exposed who do not contract the disease. This shows that in addition to the germ there must also be suitable soil for its growth and development. Such a soil is usually found in persons of feeble physique, victims of malnutrition, whose body has been weakened from any one or more of numerous causes, whether it be previous attack of sickness, loss of sleep, vice and dissipation, insanitary houses, lack of pure air, cleanliness, sunlight, outdoor exercise or proper food.

Clinical experience indicates that faulty nutrition, debility, loss of blood, anæmia, mental anxiety, diabetes, whooping cough, measles and other diseases favor the development of tuberculosis. We also know that a predisposition may be inherited, as evidenced by a delicate physique, narrow chest and general vulnerability of the tissues. A vulnerability of the tissues to the disease may also be acquired by indoor life and dust-producing occupations. One of the chief dangers of indoor life is exposure to vitiated air. The air of dwellings and workshops is never as pure as the outer air, because it is polluted by the products of respiration, combustion and decomposition, and the presence of individuals also tends to vitiate the air with dust, germs and organic matter from the skin, mouth, lungs and soiled clothing. Unless proper provision is made for the dispersion of foul air and the introduction of pure air there is much reason for assuming that these impurities play a more or less important rôle in what has been designated as "crowd poisoning," characterized in the acute form by symptoms of oppression, headache, dizziness and faintness, while the chronic effects of deficient oxygenation and purification of the blood are plainly evinced by the pallor, loss of appetite, anæmia and gradual loss of physical and mental vigor. All of these effects are intensified when human or animal beings are obliged to occupy rooms with an air supply insufficient for the proper oxygenation of the blood, and as a result of this habitual exposure to vitiated air, we note an undue prevalence of consumption in crowded dwell-

ings, workshops, prisons, public institutions, and formerly also in military barracks and battleships. Even live stock shows the baneful effects of insufficient air space, for tuberculosis among the range cattle of the far West, which are practically without shelter, is comparatively rare, while it affects from 15 to 25 per cent of dairy herds, which are housed, but without sufficient regard to light and air. Improved ventilation and increased air space has everywhere lessened the death rate, and it is chiefly by just such measures that the rate from consumption has been reduced from 11.9 to 1.2 per 1000 in the British armies. In like manner the undue prevalence of tuberculosis among the North American Indians and the negro to-day is largely a question of environment engendered by insanitary dwellings; the abrupt change from the native huts and tepees with their copious ventilation to congested and insanitary dwellings with deficient light and air space have doubtless established a peculiar vulnerability of the respiratory tract and lessened the general power of resistance. That the physical welfare of the negro responds promptly to improved environment is strikingly illustrated by a decrease in his general death rate in the city of Washington from 42.86 in 1875 to 27.92 per 1000 in 1907, and in the rate from consumption from 6.9 in 1878 to 4.5 per 1000 in 1908.

It has long been known that dust-inhaling occupations predispose to diseases of the respiratory passages, which may result in consumption. The particles of mineral dust produce an irritation of the mucous membrane of the nose, throat, respiratory organs and eyes, and the hard, sharp and angular particles of iron and stone dust may cause actual abrasions. According to Arnold, the dust which is inhaled lodges on the mucous membrane of the air passages and vesicles of the lungs, there to be coughed up, although some of the finest particles are taken up by the epithelial cells and white corpuscles and carried to the nearest lymphatic glands. The coarser particles, such as iron, stone or coal dust usually lodge upon the surface to be coughed up with the secretions. If not expectorated they will cause harm by clogging up the air vesicles and interfere with respiration. In the meantime not infrequently an irritation is set up, causing catarrhal conditions of the mucous membrane, or a more serious chronic inflammation of the respiratory organs, so common among persons engaged in dusty occupations. The chronic inflammatory conditions thus produced favor infection with the tubercle bacillus. At all events Hirt's statistics[1] show that men employed in dust-producing occupations suffer much more frequently from pneumonia and consumption than those not exposed to dust, and that there is practically no difference in frequency of disease of the digestive system. The relative frequency of these diseases per 100 workmen is as follows:

	Consumption.	Pneumonia.	Digestive disorders.
Workers in metallic dust	28.0	17.4	17.8
Workers in mineral dust	25.2	5.9	16.6
Workers in mixed dust	22.6	6.0	15.2
Workers in animal dust	20.8	7.7	20.2
Workers in vegetable dust	13.3	9.4	15.7
Workers in non-dusty trades....	11.1	4.6	16.0

[1] Cited by Harrington, Practical Hygiene, 1902, p. 678.

According to Sommerfeld, cited by Roth,[2] of 1000 deaths the number of deaths from consumption in occupations without development of dust was 381; in occupations with development of dust it was 480; in the Berlin population at the same ages it was 332.3.

Moritz and Roepke have shown that 72.5 per cent of the deaths among the metal grinders of Solingen are due to consumption, as compared with 35.5 per cent among the general population.

The death returns for 12 years of the city of Northampton, Mass., one of the centers of the cutlery and tool industry, show that among "grinders," "polishers" and "cutlers" diseases of the lungs were responsible for 72.73 per cent of the mortality, inclusive of 54.5 per cent of deaths from tuberculosis.

A collective investigation, published in 1901 and cited by Roth,[2] shows that of every 100 deaths among stonecutters, polishers and quarrymen, 86 were due to diseases of the lungs, inclusive of 55 deaths from consumption.

According to the reports of the census of 1900 the consumption death rate of marble-cutters and stonecutters in the United States is six times that of bankers, brokers and officials of companies, and the mortality in fifty-one other employments ranges between those extremes.

The amount of dust is perhaps less important than the character of the particles which compose it. The susceptibility to consumption in metal workers and stonecutters can only be explained by the fact that the hard, sharp and irregular particles of this kind of dust are more apt to produce injury of the mucous membranes of the respiratory tract. But it is not fair to assume that the less irritating dust is free from danger, for as pointed out by Roth, even the inhalation of plaster of paris or flour dust cannot be regarded with indifference, especially when it is preventable.

The Influence of Sewers in the Prevalence of Tuberculosis.

The records of the Health Office of the city of Washington show that during the past thirty years 14.5 per cent of all the deaths occuring in the District of Columbia have been caused by pulmonary tuberculosis. The death rate, however, has gradually and constantly fallen from 4.5 per 1000 in 1878 to 2.3 in 1907. The death rate from this disease in New York City has fallen in like manner from 4.27 per 1000 in 1881 to 2.42 in 1907. These reductions began long before the combat of the disease was a subject for popular education. The question naturally arises, if these reductions have resulted independent of any attempt to control the sources of infections, what are the chief factors concerned in bringing about this gratifying result? In considering the question, I know of no sanitary reforms which could have exerted a greater influence upon our general well-being than the introduction of sewers, improved water supplies and the erection of sanitary homes. It seems to me that the marked reduction in the prevalence of consumption after the introduction of sewers observed in England over forty years ago, and also in the cities of Washington

[2] Roth: Kompendium der Gewerbekrankheiten. Berlin, 1904, p. 106-108.

and New York, can only be attributed to the prevention of air pollution and of dampness. It has been estimated by Erismann that a cesspool with 18 cm. contents is capable of polluting the atmosphere in the course of twenty-four hours with 18.79 cm. of impure gas, composed of carbonic acid, ammonia, sulphuretted and carburetted hydrogen and volatile fatty acids. In view of this fact it requires no great stretch of the imagination to calculate the amount of air pollution which resulted from the 30,000 cesspools and other makeshifts prior to the introduction of the sewerage system in the city of Washington. In passing, I may remark that no two factors have contributed so much to the prolongation of human life as the improvement of the air we breathe and the water we drink.

In some cities the result has been a reduction of 50 per cent in the prevalence of tuberculosis, typhoid fever and diarrhœal diseases. The influence of impure air upon our physical well-being and the powers of resistance cannot be underrated. As a matter of fact, individuals who contract tuberculosis in cities often arrest the disease by removal to the country, showing that an abundance of pure air is a very important factor in the treatment of the disease, simply because it promotes oxygenation of the blood, stimulates the appetite and nutrition and thereby increases the general resisting power of the system. There can be no doubt as to the curative virtue of pure air, and hence we ought not to underrate its preventive properties. It is, of course, a difficult matter to explain how water is connected with the deaths other than those from waterborne diseases, yet when we consider that water enters into the composition of the body to the extent of over 60 per cent, we are in a position to appreciate the sanitary acumen of Aristotle when he wrote in his "Politica": "The greatest influence upon health is exerted by those things which we most freely and frequently require for our existence, and this is especially true of water and air."

The observations of Dr. Bowditch, of Boston, as early as 1862, clearly indicate that there is a relation between dampness of soil and pulmonary consumption, and Dr. George Buchanan, the medical officer of the privy council of Great Britain in 1867 supplied ample statistical proof that consumption became less frequent in certain towns after they had been sewered, and the soil consequently drained. In towns like Worthing, Rugby and Salisbury the deaths from consumption were reduced by 36 to 40 per cent. It is true that such a marked reduction did not always follow, but in these instances it may be fairly assumed that the soil was previously quite dry and could not be materially affected by increased drainage.

The importance of a dry, healthful building site was appreciated by Hippocrates, since he as well as Vitruvius, the father of architecture, referred in their writings to elevation as a desirable factor. One of the most striking illustrations of damp habitations as a predisposing cause to consumption has been recorded by Nowak, in the case of a prison in the vicinity of Vienna, containing on an average 200 inmates. Every convict is examined before his transport, and if found affected with incipient tuberculosis he is sent elsewhere. In spite of this precaution the deaths number about 50 per annum and the majority die from consumption. The prisoners are better fed in this institution than elsewhere, but the building rests on a wet, clayey soil, the walls reeking with moisture, and the rooms smell musty.

The relation of dampness to consumption may be explained as follows: Dampness of soil, unless special precautions have been taken, extends by capillary attraction to the walls and renders the entire house damp. Damp air abstracts an undue amount of animal heat, lowers the powers of resistance of the inmates and predisposes to catarrhal affections, and these in turn render the mucous membranes more vulnerable to the invasion of the tubercle bacilli. There is also reason for believing that the tubercle bacilli retain their vitality for a greater length of time in such an atmosphere on account of its humidity and excess of organic matter.

At all events it has long been known that tuberculosis is far more prevalent in damp, dark and insanitary houses. The children are anæmic and as puny as plants reared without the stimulating effects of sunlight. The death rate is often double and treble that of other localities. While there are doubtless other factors which determine the frightful mortality, none are more potent than dampness, deficient sunlight and ventilation. The tubercle bacillus clinging to floors and walls in carelessly expectorated sputum or droplets would be destroyed by a few hours exposure to sunlight, but finds in damp and dark basements, back-to-back houses, and yard-and-alley tenements suitable environments for its vitality and growth, and the other insanitary factors alluded to, together with the more intimate contact, materially increase the chances of infection.

PREVENTIVE MEASURES.

Time will not permit me to consider in detail the measures for the prevention for this disease, but I desire to emphasize a few which may be resorted to in the control of the sources of infection and the diminution of the predisposing causes.

1. Compulsory notification of cases to the health authorities as soon as the disease is recognized. This is of vital importance for the location and control of the source of infection and for the protection of the family and others. It has been urged that the depressing effect of such information would be too great for the patient, but this will surely be counterbalanced when we inform him that it is a curable and preventable disease, and that his chances for recovery are especially favorable if he does not reinfect himself.

The health authorities, apart from distributing proper printed directions, for the use of the family and the patient, as regard the care, disinfection of sputum and avoidance of droplet infection, should also resort to disinfection of the home and personal effects, especially upon the death of the patient or vacation of the premises.

2. The enactment and enforcement of laws against promiscuous expectoration (and coughing into the faces of persons where the sputum is liable to infect), and provisions for suitable spittoons and their proper disinfection in all public places is called for. The public should not cultivate an exaggerated fear of such cases, but has a right to insist upon clean and decent precautions.

3. The streets should be sprinkled and swept at night so as to reduce the inhalation of infected dust to a minimum.

4. The supervision of the sanitary conditions of hotels, theaters, churches, schools, ambulance service, sleeping cars, etc. should likewise be under the control of the Health Department, and house-cleaning should be accomplished, as far as practicable, by a dustless method.

5. Marriage with a tuberculous person should not only be discouraged, but absolutely prohibited by law. A tuberculous mother should not nurse her infant, and in the selection of a wet nurse a certificate of health should be demanded.

6. Isolation of tuberculous patients should be insisted upon in hospitals, asylums and public institutions. In private life the patient should at least occupy a separate bed, use separate eating and drinking utensils and neither receive nor give kisses.

7. Government inspection of dairies and of dairy and meat products and the extermination of bovine tuberculosis are clearly in the interest of public health. Until this is accomplished, or as an additional precaution, milk and cream, and even the cream used for butter and other dairy products, should be pasteurized, and all meats should be well-cooked.

Having considered the sources of infection and the indications for their control, it is well to refer to what may be done towards diminishing the predisposing causes to consumption. Many of these are questions of personal hygiene, connected with alimentation, clothing, baths, exercise, the alcohol and tobacco habit, vice diseases, etc., and I desire to emphasize here especially the duties of the State in preventive efforts.

When we recall the influence of sewers upon the prevalence of the disease and remember that only about 30 per cent of the population in the United States live in sewered towns, and about 41 per cent live in towns having public water supplies, we see at once the necessity that a system of public sewerage should go hand in hand with the public water supply. The neglect on the part of the State not only increases the dampness of the soil, but compels recourse to the various makeshifts for the collection and removal of excreta, and leads to pollution of the air, soil and water.

The influence of insanitary dwellings has been referred to and for reasons already given I consider the condemnation of houses unfit for human habitation, and substitution of sanitary homes, only second in importance to the destruction of the germs.

The State may not be in position to provide sanitary houses, but it can at least regulate and supervise the construction of all new houses with reference to the exclusion of dampness, sanitary plumbing, amount of air space, light, heating and ventilation of dwellings and clearly define what constitutes an insanitary tenement offered for rent, and provide a suitable remedy. The State should also interdict the erection of tall buildings, and of all buildings covering over 66 per cent of the lot, since they shut out light and air, thus destroying the very object for which broad streets and avenues were created, and bringing us back to the insanitary era of the medieval towns with their narrow and winding streets.

The State should pay attention to the physical development of its youth, and this is best accomplished by proper training, preferably in the open air, in connection with the public schools and playgrounds. The children of consumptives require special attention, because of the transmission of vulnerable anatomical elements which render them peculiarly liable to the disease; this predisposition may certainly be overcome, in addition to proper food, by pure air, methodical gymnastics and systematic hardening of the skin secured by bathing, and no school should be without these hygienic advantages. If it be found that school children are starving for want of food it is clearly our duty to make suitable provisions to prevent permanent dependency. In choosing a subsequent vocation for predisposed subjects it is important to avoid occupations involving sedentary habits and indoor dusty work. No effort should be spared to increase the resisting power of the individual, but as pointed out by Professor Flügge, all such efforts should not overshadow the real sources of infection.

There is abundant statistical material to indicate the influence of dust-producing occupations as a predisposing factor to tuberculosis and other pulmonary diseases, and it is clearly the duty of the State to formulate efficient laws in regard to factory sanitation and the occupations in general which are injurious to health.

It is certainly the duty of the State to see that every patient who has no home, or whose environment offers less favorable conditions for his recovery, is provided with proper care and shelter. It may be truly said, that hospital treatment of consumptives offers the best chances for recovery and the ultimate extermination of the disease, and the State, until a comprehensive system of industrial insurance has been adopted, must shoulder the responsibility in the case of patients unable to bear the financial burdens. Every city of any size should provide facilities for the isolation and proper treatment of patients, supplemented by general State sanatoria. Since the identification of the disease is the first and most important step in its treatment and prevention, the establishment of dispensaries for the recognition of incipient cases among the dependent classes seems urgently called for. Such dispensaries should become the feeders for municipal and State sanatoria, and when properly conducted, with special reference to social service, will be a most important factor in the combat against tuberculosis.

It is clearly the duty of the State to prevent destitution of the family while the bread-winner is incapacitated for work; the State should likewise suppress quackery, for no class falls more readily a prey to unscrupulous mountebanks than our consumptives.

The federal government is already performing an important duty by exercising a watchful care over the subject of tuberculosis among animals. The preventive measures urged by the Bureau of Animal Industry are of far-reaching significance, although primarily intended to protect the pocket-books of our farmers and stock-raisers. Large sums are annually, and very properly, expended to quarantine our seaports against cholera, yellow fever and small-pox, because these diseases, if permitted to gain a foothold, occur in epidemics, are rapidly fatal, and hence strike terror into a community. It is to be hoped that similar opportunities will be afforded to the Public Health Service to cope with tuberculosis, which claims more victims than all these diseases combined.

EDWARD L. TRUDEAU, M. D.

In commemoration of the sixtieth birthday of this distinguished physician, the following sonnet and reprints, prefaced by a title-page and dedication, were presented to him by his pupils:

STUDIES IN TUBERCULOSIS
BY THE PUPILS OF
DR. EDWARD L. TRUDEAU

COLLECTED IN COMMEMORATION OF
HIS SIXTIETH BIRTHDAY
OCTOBER 5, 1908

IN THE ADIRONDACKS
SARANAC LAKE
NEW YORK

To

EDWARD LIVINGSTON TRUDEAU

Doctor of Medicine
Master of Science
Founder of the Adirondack Cottage Sanitarium
and of the
Saranac Laboratory for the Study of Tuberculosis
Upon the Occasion of his Sixtieth Birthday
October 5, 1908,

THIS COLLECTION OF THE WRITINGS
OF HIS GRATEFUL PUPILS
IS AFFECTIONATELY DEDICATED

ONE PHYSICIAN,
E. L. T.

By Charlotte Stuart Best

Of infinite compassion, vision keen,
Great mind and greater heart;—of purpose high
That lifts his work to heights of majesty,
Above all motives commonplace or mean:—
His life is pledged to combat. As of old
Fought Arthur and his knights against the sway
Of murderous hordes, he strives to keep at bay
A foe more deadly, pitiless and bold,
That spoils our land and no condition spares;
The changing seasons mark his changeless aim;
Highest and lowest alike acclaim
Their champion, as steadfastly he fares,
Unresting, selfregardless, on his quest,
By all who know him, loved, revered and blessed.

CONTENTS

Allen, A. H., E. R. Baldwin and H. M. Kinghorn *Med. News*, Sept. 30, 1905 *46*
Studies on Immunity in Tuberculosis: The Properties of the Serum of Immunized Rabbits

Allen, A. H., Lawrason Brown and E. J. S. Lupton *Am. Jr. Med. Sc.*, Feb. 1907 *56*
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The Rational Application and Value of Specific Treatment for Tuberculosis

BALDWIN, E. R., E. L. Trudeau and H. M. Kinghorn
Saranac Laboratory, 1900-04 35
Studies on the Tuberculin Reaction

BALDWIN, E. R. and P. A. Levene
Studies from the Saranac Laboratory, 1900-04 38
On the Anti-Hemolytic Action of Some Cell and Tissue Constituents

BALDWIN, E. R. *Studies from the Saranac Laboratory*, 1900-1904, pp. 47-65 40
Studies on Tuberculous Serum and the Bacteriolysis of Bacillus Tuberculosis

BALDWIN, E. R. *Studies from the Saranac Laboratory*, 1900-1904, pp. 67-74 41
Anti-Tuberculin or Tuberculin-Precipitin Serums

BALDWIN, E. R. *Studies from the Saranac Laboratory*, 1900-1904, pp. 75-79 42
Differences in Precipitins Produced by Tubercle Bacilli

BALDWIN, E. R., H. M. Kinghorn and A. H. Allen
Med. News, Sept. 30, 1905 46
Studies on Immunity in Tuberculosis: The Properties of the Serum of Immunized Rabbits

BALDWIN, E. R. and J. Woods Price
Trans. 2d Meeting Nat'l Assn., May 16-18, '06 51
Studies on Immunity in Tuberculosis III. Experiments with Leucocytes, Lymph Glands and Bone Marrow Extracts of Immunized Animals

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Die "Aggressine" der Tuberkelbacillen

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Opsonins in Tuberculosis

BALDWIN, E. R. *N. Y. Med. Jr.*, June 27, 1908 66
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BROWN, Lawrason *Jr. Am. Med. Assn.*, Feb. 21, 1903 24
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The Shape of the Chest in Health and in Pulmonary Tuberculosis

BROWN, Lawrason and E. G. Pope *Am. Med.*, 1904, viii, 879 32
The Postdischarge Mortality among the Patients of the Adirondack Cottage Sanitarium

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The Treatment of the Digestive Disturbances Occurring in Pulmonary Tuberculosis

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BROWN, Lawrason *Am. Jr. Med. Sc.*, Aug., 1906 52
A Suggestion in the Treatment of Haemoptysis

BROWN, Lawrason, A. H. Allen and E. J. S. Lupton
Am. Jr. Med. Sc., Feb., 1907 56
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The Early Diagnosis of Pulmonary Tuberculosis

BROWN, Lawrason *N. Y. State Jr. Med.*, May, 1908 65
The Diagnosis of Early Pulmonary Tuberculosis

BROWN, Lawrason *N. Y. Med. Jr.*, July 4, 1908 67
Dissecting Aneurysm of the Aorta and Pulmonary Artery Following Rupture of the Arch of the Aorta

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The Diagnostic and Therapeutic Use of Tuberculin

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The Sanatorium

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The Ultimate Test of the Sanitarium Treatment of Pulmonary Tuberculosis and its Application to Results obtained in the Adirondack Cottage Sanitarium

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Further Notes on the Technique of the Tuberculo-Opsonic Test

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A Study of the Infectiousness of the Dust in the Adirondack Cottage Sanitarium

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Some Retinal Complications in Chlorosis

KINGHORN, H. M. *Montreal Med. Jr.*, March, 1901 16
Symptoms of Renal Tuberculosis

KINGHORN, H. M. *Jr. Med. Research*, 1902, viii 22
Researches on the Action of Tuberculin on Rabbit's Blood

KINGHORN, H. M. *Montreal Med. Jr.*, May, 1903 26
The Early Diagnosis of Pulmonary Tuberculosis

KINGHORN, H. M., E. L. Trudeau and E. R. Baldwin
Studies from the Saranac Lab'y 35
Studies on the Tuberculin Reaction

KINGHORN, H. M *Studies from the Saranac Laboratory*, 1900-1904, pp. 45-46 39
Action of Pepsin Digestion on Tuberculin

KINGHORN, H. M. *Studies from the Saranac Laboratory*, 1900-1904, pp. 81-2 43
Effects of Bacillus Mycoides xiii on Local Tuberculosis

KINGHORN, H. M., E. R. Baldwin and A. H. Allen
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Studies on Immunity in Tuberculosis: The Properties of the Serum of Immunized Rabbits

KINGHORN, H. M. *Med. News*, September 30, 1905 47
The Serum Diagnosis of Tuberculosis

KINGHORN, H. M. and D. C. Twichell
Am. Jr. Med. Sc., August, 1906 53
The Technique of the Tuberculo-Opsonic Test

KINGHORN, H. M. and D. C. Twichell
Am. Jr. Med. Sc., October, 1906 54
Further Notes on the Serum Diagnosis of Tuberculosis

KINGHORN, H. M. *Montreal Med. Jr.*, 1907, xxxvi, 735 59
The Hygienic and Dietetic Treatment of Pulmonary Tuberculosis

KINGHORN, H. M., D. C. Twichell and N. M. Carter
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Further Notes on the Technique of the Tuberculo-Opsonic Test

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LEVENE, P. A. *Studies from the Saranac Laboratory*, 1900-1904, pp. 27-35 37
On the Biological Relationship between Proteids

LEVENE, P. A. and E. R. Baldwin
Studies, Saranac Laboratory, 1900-04, pp. 37-44 *38*
On the Anti-Hemolytic Action of Some Cell and Tissue Constituents

LEVENE, P. A. *Studies from the Saranac Laboratory.* 1900-04, pp. 83-90 *44*
On the Bio-Chemistry of Bacillus Tuberculosis

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Trans. 2d An. Meeting Nat'l Assn., May 16-18, '06 *51*
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TUBERCULOSIS—A PLAN OF STUDY.

By W. L. Moss, M. D.,
Instructor in Medicine, the Johns Hopkins University.

The accompanying syllabus indicates the plan of study proposed for the Phipps Dispensary Staff 1908-1909. Meetings are to be held twice each month. At each meeting a definite number of the subjects from the accompanying outline will be taken up for study. References bearing on the subjects will be given out in advance of the meetings, and as a rule five men will be asked to report on the references. Ten minutes will be allowed each man in which to make his report. At the conclusion of the reports half an hour will be given to discussion. Each man will be limited to three minutes in the discussion.

Each reporter will please bring a written abstract of the articles he reports, on 4 x 6 cards, *with the title of the paper, the reference and his own name at the top.*

It is desired that the abstract contain briefly the conclusions of the author and indicate the experimental work or other basis on which the conclusions are reached.

The cards will be kept on file in the Dispensary Library and will be accessible to any of the members who wish to use them.

Please keep the syllabus for reference throughout the year so that all the members may be prepared to take part in the discussion at each meeting.

The above plan of study has now been in operation for several months with very satisfactory results.

Previously the members of the Phipps Dispensary Staff had formed a Journal Club, in which each man was assigned two or three journals which he was to follow, and from which he was to report any interesting or valuable contributions on the subject of tuberculosis. It often happened that the articles reported at a meeting were on widely differing and sometimes highly specialized phases of the tuberculosis problem, difficult to convey in brief abstract form to those who had not previously some acquaintance with the particular phase of the subject under consideration.

By introducing a systematic plan of study, as indicated above, and having a definite subject assigned in advance for each meeting, all of the members could direct their reading so as to have at least some familiarity with the subject and be prepared to discuss the papers intelligently.

A card index has been prepared of the subjects indicated in the syllabus. The first card is headed:

1. Tubercle bacilli and others of the same group.

(a) Human.

The second card is headed:

1. Tubercle bacilli and others of the same group.

(b) Bovine.

And thus throughout the entire syllabus, a card in the index is devoted to each subhead. Then all of the recent numbers of the *Index Medicus* were gone over and references bearing on the various subjects obtained. These references were transferred to appropriate cards in the card index.

PROVISIONAL PLAN OF STUDY FOR THE PHIPPS DISPENSARY STAFF OF THE JOHNS HOPKINS HOSPITAL, 1908-1909.

I. TUBERCLE BACILLI AND OTHERS OF THE SAME GROUP.

(1) Characteristics.
- Morphological.
- Tinctorial.
- Cultural.
- Chemical.
- Biological
  - Growth.
  - Reproduction.
  - Viability.
  - Pathogenicity
    - Virulence.
    - Attenuation.

(a) Human.
(b) Bovine.
(c) Avian.
(d) Piscine.
(e) Other acid fast bacilli
- Smegma.
- Hay.
- Butter.
- Leprosy.

II. Portals of Entry.
- (a) Respiratory tract.
- (b) Alimentary tract.
- (c) Genito-urinary tract.
- (d) Hereditary transmission.
- (e) Other portals of entry: Skin, eye, ear, etc.

III. Immunity.

Forms of (A) in non-susceptible animals.
(B) in susceptible animals.
- (a) Active.
  - (1) Agglutinin.
  - (2) Precipitin.
  - (3) Bacteriolysin.
  - (4) Phagocytic—opsonin.
  - (5) Antitoxic—tuberculin.
- (b) Passive sera: Marmorek. Maragliano. Transfusions.

IV. Diagnosis.
- (1) Physical signs.
- (2) Bacteriological: Sputum. Urine. Feces. Fluids: Spinal. Serous cavities.
- (3) Cytological: Blood, spinal fluid.
- (4) Chemical: Calcium metabolism, etc.
- (5) X-ray.
- (6) Biological.
  - (a) Tuberculin: Conjunctival—Wolf-Eisner, Calmette. Cutaneous—v. Pirquet, Moro, Detre. Subcutaneous.
  - (b) Opsonin.
  - (c) Agglutination: Arloing and Courmont.
  - (d) Bactericidal.
  - (e) Precipitation.
  - (f) Fixation of complement.
  - (g) Hemolysin.

V. Therapy.
- (1) Hygienic.
  - (a) Fresh air: Sunshine. Cold. Altitude. Currents of air.
  - (b) Diatetic.
- (2) Drugs.
- (3) Tuberculins. All the various kinds including bovine.
- (4) Vaccines.
  - (a) Dead, human and bovine.
  - (b) Living, human and bovine.
  - (c) Mixed tubercle bacilli and other bacteria.
- (5) Sera.
  - (a) Marmorek.
  - (b) Maragliano.
  - (c) Transfusions.
- (6) Radio-therapy.
  - (a) Historical: Colored lights.
  - (b) X-ray.
  - (c) Finsin light.
  - (d) Radium.
- (7) Hyperæmia: Bier and others.
- (8) Pneumothorax, artificial.
- (9) Exercise.

VI. Relation of Human Tuberculosis and Tuberculosis in Other Animals.
- (1) Relation of bovine to human tuberculosis.
  - (a) Clinical evidences (circumstantial) that humans can be infected by tuberculous bovines.
  - (b) Pathological statistics (circumstantial) evidence of primary alimentary infection.
  - (c) Incidence of tuberculosis in dairy cattle and of tubercle bacilli in their milk.
  - (d) Exact bacteriological determination of the variety of tubercle bacillus present in cases of human tuberculosis. (British Commission, German Commission. Theobald Smith, Ravenel, Bureau of Animal Industry and others.)
- (2) Human tuberculosis as an etiological factor in animal tuberculosis.

VII. Sociological Aspects of Tuberculosis.
- (1) Incidence.
- (2) Mortality.
- (3) Economic losses: Human and animal tuberculosis.
- (4) Prophylaxis.
  - (a) Educational.
  - (b) Legal.
  - (c) Sanitaria.

In advance of each meeting a certain number of the references are given out and after the meetings, written abstracts of the articles reported on are handed in and filed under the corresponding heading in the index.

All of the members of the staff have been requested to remember the index in their reading and to record any valuable references whether they have been presented at the regular meetings or not. In this way we feel that we are building up a valuable reference index on the subject of tuberculosis.

PROCEEDINGS OF SOCIETIES.

THE JOHNS HOPKINS MEDICAL SOCIETY.

December 7, 1908.

Dr. Frank R. Smith, the president, in the chair.

1. The Tonsil as a Factor in the Cause of Disease. Dr. J. Bordley.

Dr. Bordley considered the tonsil as an active factor in the struggle for existence. The healthy tonsil in its maximum growth at puberty is a fence against invasion. When diseased, however, it is often the portal of entry for organisms. He theorized that the tonsil prevented actual bacterial invasion of the body from the mouth, but allowed the absorption of toxin from its crypts into the general circulation.

Bacteria enter the tonsil of a child 12 hours after delivery and there produce toxins. In 200 cases of atrophic tonsils, 196 contained organisms which were proven virulent for laboratory animals. *Streptococcus pyogenes* was demonstrated in 101 of these cases. These tonsils in situ were small and hidden, and contained cheesy material in their crypts.

The symptoms in these 200 cases included wide, sluggish

pupils, periodic exophthalmus, failing hearing, coated tongue, enlarged lymphatic glands, palpitation and irregular heart; nervous dyspepsia, anorexia, diarrhœa, constipation and pallor. The patients were under normal weight. Neurasthenia, fainting attacks, tetany, scotoma and hemicrania occurred. The temperature in the morning was subnormal; in the evening, above normal. The average count of red blood corpuscles was 4,200,000; the leucocytes, 8000 to 14,000. The polymorphonuclear neutrophiles and eosinophiles were increased relatively at the expense of the small mononuclear elements. The urine was normal. The duration varied from four months to several years. Eighty-five per cent were in women.

The pathology of the tonsil was an atrophy of the general structure plus wide crypts filled with cheesy material. Cystic spaces were common. The covering was of thin, superficial epithelium. Giant cells were seen in two cases and tuberculous caseation in four.

His treatment was removal by blunt extracapsular dissection. The patients were kept in the hospital five days, using simply a gargle. The loss of blood was slight in every instance. The weight curve was interesting. A loss of 5 lbs. in the first few days was followed by an average gain of 15 lbs. in three months. No case gained less than 3 lbs. The greatest increase was 60 lbs.

In summarizing, he stated that these patients were young adults who were not well. They had no definite disease, but were weak and anemic. The tonsils had lost their resisting power and become an incubator for bacteria from which an unlimited supply of toxin was being absorbed.

He added that he had injected lymphatic ducts leading from the tonsils to the thyroid gland, which suggested to him a cause for the presence of exopthalmic symptoms in many cases.

Discussion.

Dr. J. M. West was gratified with the scientific paper, which showed so clearly the relation of the tonsils to internal disease. He agreed with Boswell, who 30 years ago maintained that any visible tonsil was a pathological condition. Time was wasted in trying to find a physiological function for a pathological lesion. He preferred dissection with a sharp knife, controlling hæmorrhage when necessary with the clamps of the general surgeon.

II. A Case of Mikulicz's Disease. Dr. R. L. Randolph.

Dr. Randolph showed a young colored woman in whom the symmetrical enlargement of the lachrymal glands had interfered with closure of the lids. This swelling had subsided in four months and was followed after this interval by enlargement of both parotid glands. The condition resembled an extreme grade of mumps. However, there was no sign of acute inflammation in either the lachrymal or parotid swellings. The spleen was not palpable; the blood was negative; and there was no history of syphilis. The case was extraordinary in that the parotid swelling arose as the lachrymal subsided.

Mikulicz first described the disease in 1892 as a symmetrical enlargement of the lachrymal, salivary and occasionally buccal glands. The usual combination is of lachrymal and parotid glands, as in this case. The condition is rare, only 35 cases being recorded and those mostly by surgeons.

Discussion.

Dr. T. B. Futcher spoke of Dr. Osler's case, reported in the American Journal of Medical Sciences for 1898. A girl of 14, also colored, showed a symmetrical enlargement of the lachrymal, parotid and submaxillary glands. The spleen was palpable. She gave a history of congenital syphilis, and the condition improved under antiluetic treatment.

III. A Study of Leprosy with Especial Reference to its Occurrence in the Bahama Islands. Dr. C. A. Penrose.

Dr. Penrose gave a description of the Baltimore expedition to the Bahama Islands, illustrating his talk with lantern slides.

December 21, 1908.

Meeting of the Johns Hopkins Hospital Medical Society, Dr. Frank R. Smith, the president, in the chair.

I. Exhibition of Surgical Cases. Dr. J. W. Churchman.

Typhoid Cholecystitis.—Dr. Churchman reported a woman of 38 who had had pneumonia six weeks before admission. Both lower lobes were involved. No history of typhoid fever at any time could be elicited.

Five days before admission she had an attack of abdominal cramps with nausea and vomiting. There was no jaundice. The liver was enlarged and the gall bladder palpable. At operation a large empyema of the gall bladder was drained. No stones were found. Cultures from the pus yielded *B. typhosus* in pure culture. A Widal reaction done at this time was positive.

The case was interesting in that no history of any previous illness other than the pneumonia was obtained. The pneumonia had a sharp onset with pain in the side, cough and bloody expectoration. It apparently resolved by lysis, as there was some bronchitis still present on admission. Perhaps the pneumonia was a complication of an attack of typhoid fever.

Appendicitis in Children.—Reported in full in the January, 1909, number of this journal.

Subphrenic Abscess following Appendicitis.—This patient, a man of 37, was operated upon in Greensboro, N. C., nine days after an attack of acute appendicitis. The appendix was not found, but an abscess was drained. This was three months before admission. During the last month he had noticed pain in the left iliac fossa and the presence of a lump, which was hard and tender. Some occasional pain had occurred in the right iliac fossa also.

On admission an appendectomy was done through the right rectus, and the mass on the left explored. It was found to be an œdematous, adherent omentum. No pus was found. He did very poorly after operation, and had great discomfort,

inability to sleep, loss of appetite and fever. An ophthalmo-tuberculin test was negative.

A few days later an abscess appeared extraperitoneally on the left; it was opened and drained. The pus was yellowish and suggested actinomycosis, but no rays or filaments could be demonstrated. Following this the border of the liver descended 3 cm. below the costal margin in the right mammary link. Impaired resonance and diminished breath sounds were made out at the base of the right lung behind. There was a paravertebral triangle of dulness on the left. These signs, the septic temperature, and a leucocytosis of 25,000, gave a probable diagnosis of subphrenic abscess. This was confirmed by exploratory puncture; portions of the 10th and 11th ribs were excised; and the abscess cavity was drained. His convalescence from now on was uninterrupted.

Dr. Churchman cited the classification of subphrenic abscesses, made by Barnard, of the University of London. He reported 76 cases.

On analysis, this case had its origin in an acute appendicitis with abscess, which crept retroperitoneally to the left and also spread insidiously upward, causing the subphrenic abscess of the right extraperitoneal type.

Luetic Bursitis.—This patient complained of a bilateral house-maid's knee. Beside the prepatellar bursæ, both bursæ over the olecranons were involved. There was a history of urethritis, and definite tertiary syphilitic lesions were found. Through antiluetic treatment the swelling of all the bursæ disappeared. The features emphasized were the symmetrical involvement, without pain, and the relief by anti-syphilitic measures.

He also described another case typical of the second form, namely, the gummatous bursitis.

II. Exhibition of a Case of Alopecia Universalis. DR. L. F. BARKER.

Dr. Barker exhibited a Norwegian sailor, 38 years old, who was suffering from diabetes mellitus. A year and a half previously he had noticed a sudden increase in appetite, excessive thirst, and increased amount and frequency of urination. This had followed a period of a few months in which he had suffered domestic and financial worries.

A year later, coincident with a rapid loss of weight, twenty pounds in one month, his hair began to fall out.

The feature of the physical findings was the absence of the hair over the entire body. One hair was found upon the head, a few in the axillæ (hirsæ) and on the legs (lanugæ), and about sixty upon the pubes (pubæ). There were no eyebrows or lashes (supercilii), nor any hair in the nares (vibrissæ), in the ears (tragæ), or on the face (barbæ). The hair found was fine, of normal size and uniform calibre, showed no nodes, and contained no air. The sweat glands were not changed. The skin of the scalp was tense, smooth, and glistening.

The fact that a slight papular eruption with bran-like scales appeared before the hair fell out was evidence of a seborrhœa sicca with eczema following. The alopecia may have been due to the seborrhœa.

Dr. Barker considered the question as to whether he was dealing with a trophic disturbance of diabetes or a mere accidental occurrence. The loss of hair in diabetes has been described by Dr. Gilchrist. It amounts to a thinning of the hair, as a rule.

Dr. Prince Morrow reported one case of complete alopecia in diabetes and several incomplete cases. But in the literature the cases have universally followed a neural or psychic trauma, as injury to the skull, a stroke of lightning, or fright. This is probably the second case in the literature of alopecia universalis in a diabetic subject. Dr. Barker feels there is some connection between the two—that it is not an accidental occurrence.

III. A New System of Open Air Construction for Hospitals and Tenement Houses. DR. SARASON, Berlin, Germany.

Dr. Sarason discussed his plans for the construction of dwelling houses, tenements, sanatoria, and hospitals, which enable a maximum of open air and uncovered porch to the occupants. Diminishing the width of each higher floor so that the veranda of the floor below is not roofed over, thus constructing the building on the plan of terraces one above another, the beds on every floor can be wheeled out into the open air with the open sky above them—the object which he considers very important. The paper was illustrated by plans and photographs upon the epidioscope.

NOTES ON NEW BOOKS.

The Skin Affections of Childhood, with special reference to those of more common occurrence, and their diagnosis and treatment. By H. G. ADAMSON, M. D., London, M. R. C. P., etc. (*London: Henry Frowde and Hodder & Stoughton, 1907.*) *Oxford Medical Publications.*

The principal value of this short manual on the Skin Affections in Childhood, by Dr. H. G. Adamson, is that the book is based very largely upon his own extensive personal experience. There is good reason to present thus separately the diseases of the skin as occurring in infancy and childhood, as many of the more common skin affections are limited to an early period of life, and others occurring at all ages exhibit in infancy peculiar manifestations. The author makes no pretense to discuss exhaustively either the etiology of many of the affections nor to describe minutely their pathology. In nearly all instances, however, he does very satisfactorily discuss the objective lesions seen in childhood, and suggests the line of treatment which he himself has found most serviceable. Concerning several of the diseases, such as eczema and urticaria, partly induced by intestinal disturbances, but little is said as to the exact method in which the diet should be altered for infants or older children in the cure of these affections.

The author recognizes the importance of classifying the diseases of the skin as far as possible on an etiological basis and has divided the affections into three main groups: First, those dependent upon direct physical causes; second, those due to local

parasitic action: (a) animal, (b) mould fungi, (c) microbic; and third, affections due to toxæmia and general microbic infections. To these, for the sake of convenience, he has added three additional groups, one on congenital affections, one on affections of nervous origin, and a final one, including those diseases whose etiology is unknown.

Perhaps a little too much space is given to the conditions which are very rare in children, but in the main emphasis has been laid on the more common skin affections. Particularly satisfactory is the writer's discussion of impetigo, tuberculosis of the skin, lichen urticatus, the latter a very frequent affection which is often unrecognized.

The value of the X-ray treatment in ring-worm and certain other diseases is dwelt upon and the method of limiting the ray to the affected part is satisfactorily described. At the end of the book are a number of formulæ found valuable by the author in the treatment of many skin lesions.

Altogether the little manual seems to have fulfilled the purpose of the writer which was to furnish a practical guide to the clinical study and treatment of the skin affections in children, and can be particularly recommended as a help to those whose interest lies largely in pediatrics. J. H. M. K., Jr.

Pathogenic Micro-organisms, Including Bacteria and Protozoa. By WILLIAM HALLOCK PARK, M. D., assisted by ANNA W. WILLIAMS, M. D. Third edition, enlarged and revised. 642 pp. (*New York and Philadelphia: Lee & Febiger, 1908.*)

We have had occasion to comment favorably upon previous editions of Park's Bacteriology and take pleasure in again referring to this excellent text-book. The present 1908 edition has been considerably enlarged, such subjects as opsones and the bacteriology of the normal intestine receiving more adequate presentation. The author is conservative in his opinion as to the accuracy of the opsonic index, but in general is lead to believe in the efficacy of the vaccine treatment of infections. The recent important work of Tissier and his followers upon some of the anærobic and the acid-resisting bacteria of the intestines is carefully reviewed and in the chapter on the typhoid bacillus the importance of the chronic bacillus carrier is properly emphasized. In the section dealing with meningitis and the meningococcus, Dr. Park does not express a particularly favorable opinion of the serum treatment of meningitis, in view of the recent statistics reported by Flexner and Jobling. As in the previous editions, the chapters on diphtheria and tuberculosis are the most valuable sections to be found in any text-books on this subject, while that portion of the book dealing with protozoa, written by Miss Williams, remains the most authoritative publication dealing with this group of micro-organisms.

A Manual of Obstetrical Technique, as Applied to Private Practice, with a Chapter on Abortion, Premature Labor and Curettage. By JOSEPH BROWN COOKE, M. D., etc. Illustrated. Sixth edition, enlarged and fully revised. (*Philadelphia and London: J. B. Lippincott Company, 1908.*)

No book without value ever reaches a sixth edition, and those who have used this manual will be glad to note its continued success. It really requires no recommendation. For the general practitioner it is an admirable little volume, clearly written and with emphasis laid on the important points. If a doctor follows closely the author's directions, he will have no reason to regret them.

A Manual of Diseases of Children. By JOHN RUHRÄH, M. D. Second edition, thoroughly revised. (*Philadelphia and London: W. B. Saunders Company, 1908.*)

A second edition of A Manual of Diseases of Infants and Children, by Dr. John Ruhräh, indicates that the book met with a favorable reception from both practitioners and students. It certainly does in a more satisfactory manner than any manual with which we are familiar present succinctly the various affections of infancy and childhood. The section on infant feeding occupies a large space proportionately and is for the most part taken from Holt's Text-Book. It is probable that in a subsequent edition less space will be given to the several tables suggesting the amount and percentages fed to infants of various ages and that more weight will be laid on the calorific need of the patient.

The necessarily brief descriptions and rather abrupt style are to a certain extent compensated for by a reference to the original articles concerning many of the diseases treated. It is doubtful, however, whether the ordinary medical student will not be content with the somewhat didactic descriptions of the manual.

J. H. M. K., JR.

A Handbook of Suggestive Therapeutics, Applied Hypnotism, Psychic Science. By HENRY S. MUNRO, M. D. Second edition. (*St. Louis: C. V. Mosby Medical Book and Publishing Company, 1908.*)

This is a book of 360 pages, the greater part of which is given over to "detailed explanation of how to apply suggestion efficaciously, both with and without hypnotism as a therapeutic adjunct," in which explanation numerous brief case reports form a part. There is considerable discussion of a philosophic, socialistic or other nature which at times rather serves to obscure than to render the subject clearer.

That the book is in its second edition is proof that it has achieved some popularity and this is not surprising for there is much good sense displayed, and the author's ideas are as a rule correct. The manner of presentation does not appeal to the reviewer, who much prefers the work of Dubois, despite the fact that his cases are described in "high-sounding, neurological phraseology." The author's style might be less offensive if the book were not printed in so eccentric a manner, as indiscriminately black-faced type is used to accentuate something which as a rule it were better not. Naturally this has the effect of weakening the parts it were desirable to emphasize. On the whole the book can hardly be commended. W. R. D.

The Principles and Practice of Gynecology. For Students and Practitioners. By E. C. DUDLEY, A. M., M. D., Professor of Gynecology, Northwestern University Medical School, Chicago, Ill., etc. Fifth edition, revised and enlarged. 806 pages, with 431 illustrations and 20 full-page plates in colors and monochrome. (*Philadelphia and New York: Lee & Febiger, 1908.*)

The writer states in the preface to this the fifth edition of his work, that, as in the previous editions, he has divided the subjects, not in the usual manner of grouping in each part all the divers diseases of some special organ, but so far as practicable he has arranged them according to their pathological and etiological sequence.

He has thoroughly revised the text and has included the recent advances in gynecology, and has so condensed and rewritten the book that the new matter has been added without materially enlarging the volume. The following chapters have been subjected to special changes: Treatment of Salpingitis; Ovaritis, and Pelvic Peritonitis; Treatment of Myoma Uteri; Treatment of Carcinoma Uteri; Treatment of Descent of Uterus; and Treatment of Retroversion and Retroflexion. Two new chapters have been added to the book, one an introductory chapter on the Defense of Gynecology as a Specialty, and the other on Incontinence of Urine in Women.

To those who are familiar with the previous editions of the work, a further review of the present one is not necessary. To

those who are not familiar with this book, the following excellent features may be mentioned:

1. The treatment of the subject by considering general pathological processes as traumatisms, infections, tumors, etc., under these heads and not as special diseases of each organ, thus presenting a clearer picture of these pathological processes and their natural course.

2. The special attention to plastic work and minor gynecological operations, a department of gynecology to which the author has made many valuable contributions and one which is often slighted in works on the subject.

3. As the fifth edition it represents not only a thorough revision of previous ones, but also includes the most recent advances in gynecology.

4. In this work the author has described the methods of diagnosis and treatment which in his experience have proven most valuable.

To the student and practitioner, for whom this book is written, it should prove, as it has in the past, one of the most valuable treatises on the principles and practice of gynecology.

J. A. S.

Economic Zoology. An Introductory Text-Book in Zoology, with Special Reference to its Applications in Agriculture, Commerce and Medicine. By HERBERT OSBORN, M. Sc., Professor of Zoology in the Ohio State University. Price, $2.00. (*New York: The Macmillan Company, 1908.*)

This book should be in the hands of every physician because of its close bearing upon the practice of medicine. If the facts of Zoology were clearly known to those who investigate disease, fewer idle theories would be formulated and closer attention would be given to the etiology of disease. An enumeration of a few of the practical medical topics here presented will suffice to show the great value of the book. The author treats of protozoa and their relations to malaria, of trypanosoma as a cause of sleeping sickness, of the cattle tick as a cause of Texas fever, of the flea and other similar disease carriers. The accounts given of the various species described are clear and definite and their usefulness is much increased by excellent illustrations. The volume also deserves a place in the library of every family and has a wide range of usefulness. The index, although full, is not carefully compiled.

Hygiene for Nurses. By ISABEL MCISAAC, author of "Primary Nursing Technique" (*New York: The Macmillan Company, 1908.*)

This, the second, in what is designed by Miss McIsaac as a series of elementary text-books for nurses, has reached us from The Macmillan Company, and in its 200 pages of rather large type printing may be found a surprising amount of suggestive matter on hygiene as related to a nurse's work. Miss McIsaac has wisely used her material where nursing experience has not heretofore covered the ground in the form of entire reports or excerpts from government, city or committee bulletins, or as quotations from standard writings on hygiene, and thus her book is authoritative in a way it could not otherwise be. Where the author's personal comment is introduced the statements are often pleasantly individual in style, and Miss McIsaac does not hesitate to give to a spade it proper name. Dirt is dirt in her estimation, and can be removed only by methods for getting rid of dirt—preferably as a rule by old-fashioned scrubbing appliances, with soap and water. However, nurses are told how and when to use disinfectants—they have presumably had the *why* in their technical lectures—how to dispose of sewage and garbage according to modern practices, and by searching diligently, under several separate headings, one arrives at a fair notion of the value of sunlight as a germ-destroyer. In the table of contents may be noted "Soil and Water," "Personal," "School" and "Household Hygiene," "The Hygiene of Occupation," relating especially to women and children, and with numerous opinions, even from foreign countries,—but why so many prior to 1900 when the remainder of the book is so eminently up to date?—and the book ends with "Quarantine." The drainage and sewage methods are clearly presented and are given practically all of the few illustrations by cuts in the book. The subject of "Food," including its preservation and adulteration, is made quite interesting. "Causes and Dissemination of Disease" is another chapter, and under the title of "Air" is included ventilation, heating and lighting, besides climate and the composition of air.

"Hygiene for Nurses" comes at an opportune moment, for never before has all the world been so intently seeking health by preventive measures, and nurses, it would seem, have given to them a splendid opportunity to rightly instruct the public in this regard.

A Dictionary of Medical Treatment for Students and Junior Practitioners. By ARTHUR LATHAM, M. D., Physician to St. George's Hospital, London. (*Philadelphia: P. Blakiston's Son & Co., 1908.*)

The writer of this work has endeavored to give in small compass the main points in the treatment of medical diseases as distinct from surgical or special practice. The work is intended for students and young practitioners and might be described as a pocket dictionary. On the whole it may be said that the discussion of methods of treatment is most satisfactory and it is a pleasure to find that therapeutic measures other than the giving of drugs receive adequate attention. There are some points, however, about which we would have preferred other advice to be given. One is as regards the indications for tapping in pleurisy with effusion. The old indications as to the amount of fluid, degree of distress, etc., are given here, but the advisability of not waiting for these but tapping as soon as fluid can be recognized is becoming more and more the rule, and it is important that students should be taught this. The importance of early tapping cannot be over-emphasized. The references to the use of the bath treatment in typhoid fever hardly do justice to it and the advice to give opium by enema for abdominal tenderness in this disease cannot be endorsed. The use of gelatine injections in the treatment of aneurism has been generally discredited, the same result being gained by giving the calcium salts by mouth. Under epidemic cerebrospinal meningitis there is no mention of the use of the specific serum. Despite the points which have been noted, on the whole the teaching of this work is sound and it can be cordially recommended as a pocket handbook.

Guide to the Clinical Examination and Treatment of Sick Children. Second edition, greatly enlarged and rewritten. By JOHN THOMSON, M. D. (*Chicago: W. T. Keener & Co., 1908.*)

The subject is treated in 629 pages of rather large print, in which the author tries to treat the most important diseases of infancy and childhood. The book is written in quite an attractive manner and its short compass will no doubt recommend itself to many readers. At the same time it can hardly be regarded as a very valuable addition to the pediatric literature.

Vaccine Therapy and the Opsonic Method of Treatment. By R. W. ALLEN, M. D., B. S. (Lond.), etc. Second edition. (*Philadelphia: P. Blakiston's Son & Co., 1908.*) Price, $2.

The second enlarged edition of this book was called forth, according to the author, by the great progress in vaccine therapy during the year elapsing from the date of publication of the first edition. In its pages are found all the data concerning vaccination based on opsonic estimations in various diseases as well as a clear exposition of the methods employed. As a review of

modern work along these lines the book cannot be criticised; it is compact, well-written, extremely interesting, and consequently valuable as a collection of results obtained. We do not believe, however, that the present state of opsonic and vaccine therapy justifies the extreme enthusiasm of the author as to the present and future status of this most important question. Certainly there is sufficient evidence of the errors of the methods employed to warrant some conservatism in predicting the ultimate outcome of vaccine therapy and opsonic treatment. S. S.

Abdominal Operations. By B. G. A. MOYNIHAN, M. S. (London), F. R. C. S. (Leeds). Second edition, thoroughly revised. (*Philadelphia and London: W. B. Saunders Company, 1906.*)

The book is divided into five sections as follows: General Considerations; Operations upon the Stomach; Operations upon the Intestines; Operations upon the Liver; Operations upon the Pancreas and Spleen.

No gynecological operations are described, nor is the surgery of organs which do not lie entirely intraperitoneally, such as the kidney and bladder, considered. The operations for hernia are also omitted.

The author has very rightly omitted the descriptions of the various mechanical devices for intestinal anastomoses, as they have served their purpose and are now out of date.

There is a thorough discussion of each organ in turn, and only the latest and most practical operations are described.

There are numerous references scattered throughout the book. The book is well printed, the illustrations are good, and the work is by far the best as yet published on abdominal operations.

J. S. D.

A Manual of Diseases of the Nose and Throat. By CORNELIUS COAKLEY, A. M., M. D. Fourth edition. (*New York: Lea and Febiger, 1908.*)

The new edition of this manual demonstrates that this work has filled a want, namely, a treatise in this specialty which is concise and at the same time up-to-date and comprehensive. While intended primarily for students and general practitioners, it is also useful to those making a specialty of this branch. This edition deserves the same praise that former ones have received in this journal.

A few of the chapters do not, however, meet with unqualified approval. Chapter IV is entitled "Antisepsis in Operations upon the Upper Respiratory Tract" and the author devotes it to the description of methods of making the upper air tract sterile. The chapter would have been better named "Asepsis in Operations on the Upper Air Tract" and directions as perfect as that used in performing a laparotomy should be given for a special technique in this branch of surgery. Asepsis should be insisted on in these operations and the cases should be made hospital patients. To those who hold this view the results obtained have justified this course. Infections following operations on the upper air tract have resulted, not so much from organisms present there, as from those introduced by the operator's unclean hands, instruments or dressings.

The chapters on the nasal accessory sinuses are complete and especially satisfactory. However, the author's frequent changes in method in treating disease of some of these cavities, indicates present unsettled opinions regarding these troublesome cases.

The most serious drawback to the work is the antiquated treatment of hypertrophies and disease of Waldeyer's lymphatic ring. The use of the Loewenberg forceps and of the various forms of tonsillotomes and of galvano-cautery puncture of the tonsils has been abandoned by most of the advanced laryngologists of the present day. Since we know that all parts of the hypertrophied tonsil are diseased, the only rational method is to remove it as completely as possible. In the case of adenoids this can be best done with sharp-cutting curettes. The faucial tonsils can be completely dissected out with their capsule by the simple and safe method of Worthington. A series of several hundred cases has demonstrated the value of this method both for adults under cocaine anæsthesia and for children under ether.

SYLVAN ROSENHEIM.

International Clinics. Vol. IV. Eighteenth series. (*Philadelphia and London: J. B. Lippincott Company, 1908.*)

The contributors to this volume are as usual both American and European, and their papers cover a wide ground under the general headings of Treatment, Medicine, Surgery, Gynecology and Obstetrics, etc. One of the most striking features of these series is the difference shown in method of presenting a subject by our own and the foreign doctors. There is usually a greater conciseness in the articles contributed from abroad, but in general merit they are quite even. There is no "Clinic" of especial note in this volume, which offers, however, a number of papers of interest. Cumston's review of the subject of "Paronychia Lateralis" and T. R. Brown's article on "Splanchnoptosis" will find many readers as they both describe well common affections which are often as much trouble to the doctor as to the patient. But any reader who picks up the book will find it worth his while to read one or more of the "Clinics."

Essentials of Medicine. A Text-Book of Medicine for Students Beginning a Medical Course, for Nurses and for all Others Interested in the Care of the Sick. By CHARLES PHILLIPS EMERSON, late Resident Physician, The Johns Hopkins Hospital; and Associate in Medicine, The Johns Hopkins University. pp. 372. (*Philadelphia and London: J. B. Lippincott Company.*)

To quote from the preface—by no means the least interesting part of a thoroughly interesting book—"Many American students lack perspective in their medical studies. They do not learn the A, B, C of disease first and then proceed to its more difficult study. . . . . Our nurses often know a great deal in a general indefinite, inaccurate way. They seldom have a clear, sharp mental picture of the elements of a subject."

Dr. Emerson has provided us with a work which, if carefully read, will go far towards alleviating the mental dyspepsia now so prevalent, not only among second and third year students and nurses, but also among others of maturer years. In a book of somewhat less than 400 pages, parts of which are taken up by illustrations, he has given us a concise but clear account of the more salient points relating to the origin and nature of the more common disease processes. Possibly the most subtle charm of the book lies in the fact that while the reader is having expounded to him the fundamental and elementary, he does not consciously find himself convicted of the ignorance which he may (or may not) be guilty of. Quiz Compends (we have heard) are sometimes used by fourth-year students and even by graduates, but they are not given a prominent place in their book-shelves. Dr. Emerson's book is not a Quiz Compend; it may be found on any one's office table and yet the owner may still look the world in the face unblushingly.

In a work of this kind it would, of course, be easy to pick out not a few errors of omission and of commission, but this is a very small part of the reviewer's function. In view of the present deluge of so-called medical literature it becomes his main duty to state, after careful consideration, whether he considers this or that book to be "worth while." Dr. Emerson's book will not only serve to clear away a certain amount of chaos but will also stimulate the reader to further accurate study. We believe that it will prove an efficient aid not only to junior students and nurses but also to others—not excepting their teachers. F. R. S.

BOOKS RECEIVED.

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Anatomie und Mechanismus der Skoliose. Von Dr. Carl Nicoladoni. Mit 54 Figuren auf 37 Tafeln und dem Porträt des Verfassers. 1909. 8vo. 58 pages. Urban & Schwarzenberg, Berlin und Wien.

Modern Medicine. Its Theory and Practice. In Original Contributions by American and Foreign Authors. Edited by William Osler, M. D., assisted by Thomas McCrae, M. D. Volume V. Diseases of the Alimentary Tract. Illustrated. 1908. 8vo. 903 pages. Lea & Febiger, Philadelphia and New York.

Essentials of Medicine. A Text-Book of Medicine for Students Beginning a Medical Course, for Nurses, and for All Others Interested in the Care of the Sick. By Charles Phillips Emerson, M. D. Illustrated by the Author. [1908.] 8vo. 383 pages. J. B. Lippincott Company, Philadelphia and London.

Guide to the Clinical Examination and Treatment of Sick Children. By John Thomson, M. D. Second edition, greatly enlarged and rewritten. With 160 illustrations. [1908.] 8vo. 629 pages. W. T. Keener & Co., Chicago.

Diseases of the Genito-Urinary Organs and Kidney. By Robert Holmes Greene, A. M., M. D., and Harlow Brooks, M. D. Second edition, revised and enlarged. With 323 illustrations. 1908. 8vo. 605 pages. W. B. Saunders Company, Philadelphia and London.

A Text-Book of General Bacteriology. By Edwin O. Jordan, Ph. D. Fully illustrated. 1908. 8vo. 557 pages. W. B. Saunders Company, Philadelphia and London.

A Text-Book of General Pathology. By J. Martin Beattie, M. A. (N. Z.), M. D. (Edin.), and W. E. Carnegie Dickson, M. D., B. Sc., F. R. C. P. (Edin.). With 162 illustrations and 4 colored plates from original preparations. 1908. 8vo. 475 pages. P. Blakiston's Son & Co., Philadelphia.

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International Clinics. A Quarterly of Illustrated Clinical Lectures and Especially Prepared Original Articles. Edited by W. T. Longcope, M. D. Eighteenth series, Vol. IV. 1908. 8vo. 310 pages. J. B. Lippincott Company, Philadelphia and London.

Medical Gynecology. By Samuel Wyllis Bandler, M. D. With original illustrations. 1908. 8vo. 676 pages. W. B. Saunders Company, Philadelphia and London.

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A Text-Book of Genito-Urinary Diseases. Including Functional Sexual Disorders in Man. By Doctor Leopold Casper. Translated and edited with additions by Charles W. Bonney, B. L., M. D. Second edition, revised and enlarged. With 230 illustrations and 24 full-page plates, of which 8 are in colors. 1909. 8vo. 645 pages. P. Blakiston's Son & Co., Philadelphia.

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The National Standard Dispensatory. Containing the Natural History, Chemistry, Pharmacy, Actions and Uses of Medicines. In Accordance with the Eighth Decennial Revision of the United States Pharmacopœia, as Amended to 1908. By Hobart Amory Hare, B. Sc., M. D.; Charles Caspari, Jr., Ph. G., Phar. D.; Henry H. Rusby, M. D.; Joseph F. Geisler, Ph. C.; Edward Kremers, Ph. D., and Daniel Base, Ph. D. Second edition, thoroughly revised and much enlarged. 1909. 4to. 2011 pages. Lea & Febiger, Philadelphia and New York.

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